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Paper TRADE JOURNAL

REG. U.S. PAT. OFF.

VOLUME 125, No. 6 AUGUST 7, 1947

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● Makers of fine cotton content paper were skeptical when RAYCO Linter Cotton was first offered them a few years ago. But Rayco fiber specialists, working in laboratory and mill, solved the technical problems involved in processing cotton linters for paper making.

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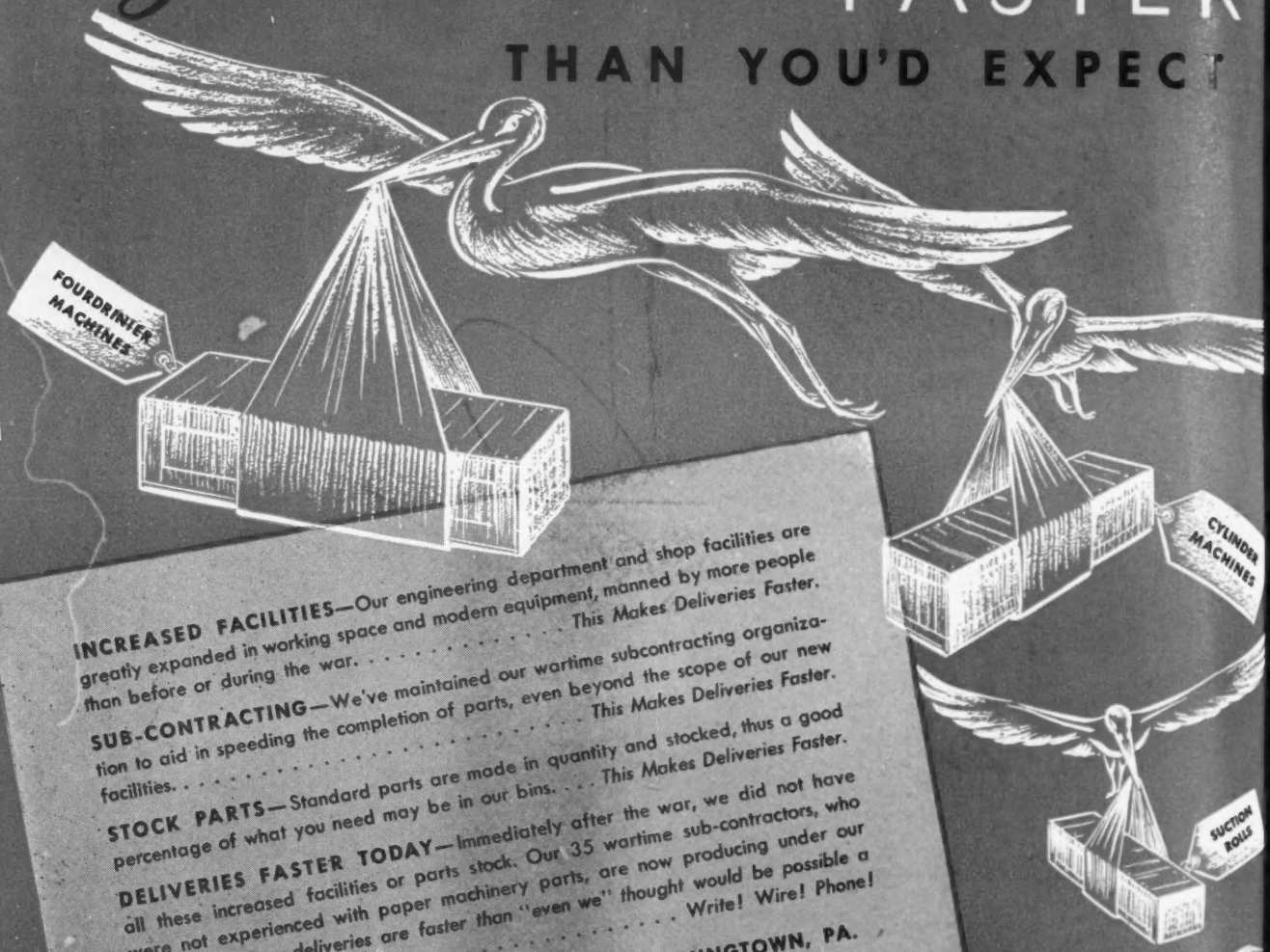
THAN YOU'D EXPECT



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SUB-CONTRACTING—We've maintained our wartime subcontracting organization to aid in speeding the completion of parts, even beyond the scope of our new facilities. . . . . This Makes Deliveries Faster.

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DELIVERIES FASTER TODAY—Immediately after the war, we did not have all these increased facilities or parts stock. Our 35 wartime sub-contractors, who were not experienced with paper machinery parts, are now producing under our supervision. Now, deliveries are faster than "even we" thought would be possible a few months ago. . . . . Write! Wire! Phone!

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Designers and Builders of Paper Making Machinery

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CALENDAR OF COMING EVENTS

August 25, 1947—National Paper Trade Association of the U. S., Inc., Midwest Regional Meeting, Hotel Sherman, Chicago.

September 3-5, 1947—TAPPI Fundamental Research Meeting, Appleton, Wis.

September 25-26, 1947—TAPPI Plastics Meeting, New State College of Forestry, Syracuse, N. Y.

October 4-6, 1947—National Association of Waste Material Dealers, Inc. Fall Convention, Hotel Ritz-Carlton, Atlantic City, N. J.

October 9-11, 1947—TAPPI Alkaline Pulping and Chemical Products Meeting, Asheville, N. C.

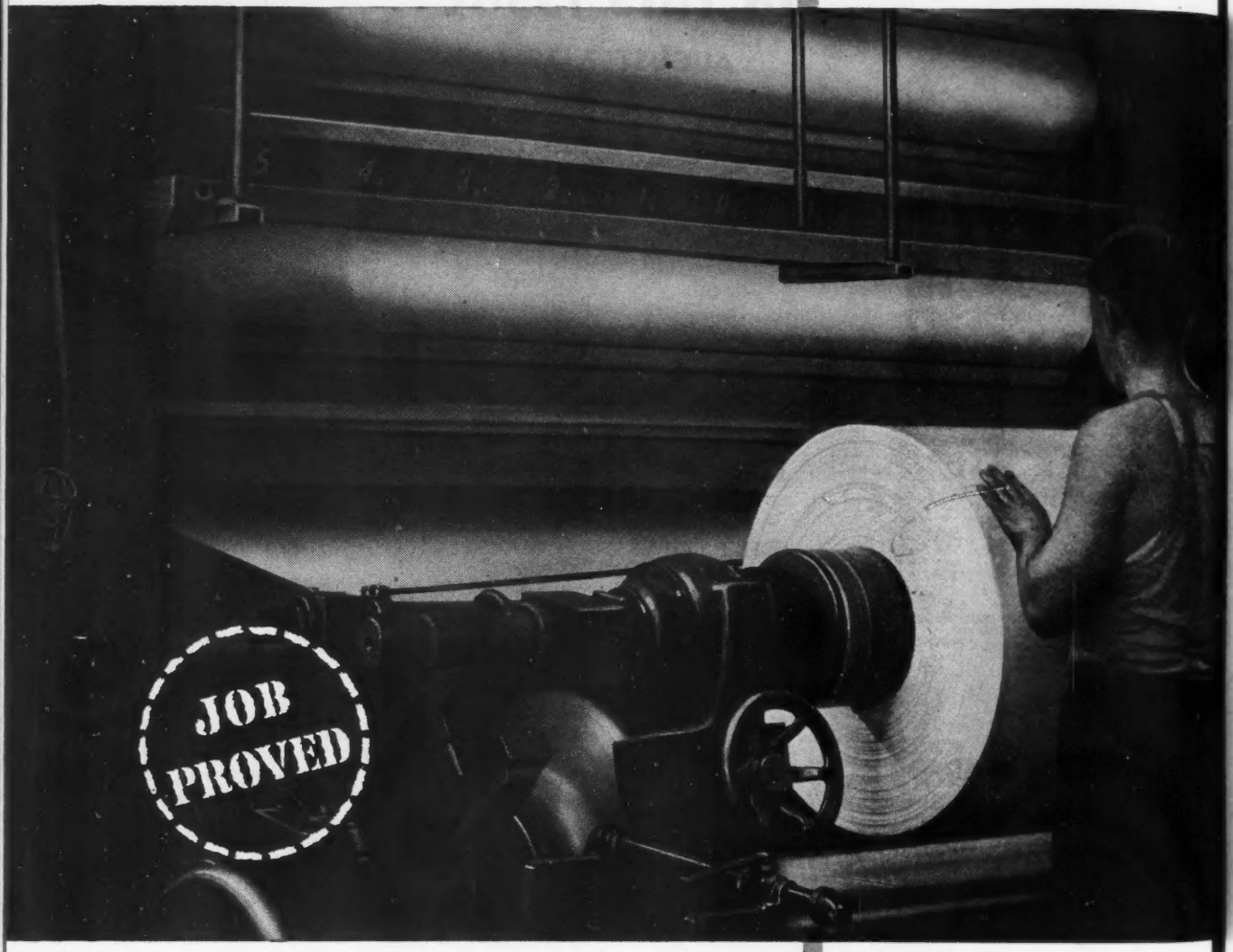
October 23-24, 1947—TAPPI Fibrous Agricultural Residues Meeting, Alton, Ill.

October 27-29, 1947—The National Paper Trade Association of the U. S., Inc., Semi-annual Convention, Hotel Sherman, Chicago.

November 3-5, 1947—TAPPI Second Engineering Conference, Philadelphia, Pa.

May 18-20, 1948—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Roosevelt Hotel, New Orleans, La.

Estimated Savings . . . 50%



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An outstanding New England paper mill was using a certain type lubricant on the bevel gears and spur gears of various paper machines. As results were far from satisfactory, they called in a Sun Engineer.

A 50% saving in lubricating costs was estimated, as a result of switching to the Sun lubricant recommended by the engineer. This "Job-Proved" product, used in dozens of paper mills, clings to gear teeth, prevents splatter and drip. It is typical of the many Sun products specially refined for paper-making machinery.

This case is just one out of the many in which Sun's "Job-Proved" lubricants and Sun Engineers have helped papeç-makers to cut costs, speed up production or improve their products. For problems involving petroleum products, call the nearest Sun office.

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INDUSTRIAL PRODUCTS

Paper TRADE JOURNAL
REG. U. S. PAT. OFF.
VOL. 125, NO. 6 AUGUST 7, 1947

Bureau Will Study Waterproof Papers

WASHINGTON, D. C.—A comprehensive investigation of waterproofed papers—used for such purposes as packaging, curing of concrete, and moisture barriers in buildings—is being undertaken at the National Bureau of Standards through a fellowship of the Waterproof Paper Manufacturers Association. A long-range research program, extending over at least three years, has been jointly agreed upon. The services of Robert C. Reichel as research associate are being provided by the association, with laboratory facilities and technical assistance furnished by the Bureau. The papers to be studied comprise a wide variety of types of high-strength papers having high resistance to permeation by water and water vapor obtained by use of asphalt and other resistant materials.

Mr. Reichel, a graduate of the University of Illinois, was formerly research associate at the Bureau for the Insulation Board Institute. More recently he has been architectural field representative for the Portland Cement Association, following war service in the Navy's Civil Engineer Corps. He is a member of the American Society of Civil Engineers and the Society of American Military Engineers.

The project for immediate investigation at the Bureau is the development of a suitable accelerated aging test for predicting permanence of the papers. This phase of the work will include new or improved tests for measuring changes in properties of the papers when exposed to deteriorating influences. The aging treatment will consist of exposure to cycles of extreme moisture and temperature conditions to which the papers may be subjected in use. The methods for determining extent of deterioration comprise tests for changes in strength, dimensions, and permeability to water and water vapor, and for ply separation.

N. C. Pulp Raises Wage Scale

PLYMOUTH, N. C.—A new agreement increasing the wages of all employes on the hourly basis of 15 cents an hour and raising the base pay of each worker from 85 cents an hour to $1 at the North Carolina Pulp Company, here, becomes effective August 1. Officials said negotiations on the proposed wage increase were begun July 21 and concluded three days later.

Mando Adopts Two-Way Radio To Speed Woods Operation

CHARLES A. UPSON

Upson Again Named to Forestry College Board

LOCKPORT, N. Y.—Charles A. Upson, founder and chairman of the board of directors of The Upson Company, has been re-appointed by Governor Thomas E. Dewey as a trustee of the New York State College of Forestry, at Syracuse, for a term of six years. Mr. Upson has been a member of the board of trustees of the state forestry college for the past 16 years.

As board chairman and former president of the fiberboard wall and ceiling panel manufacturing concern which he founded 37 years ago, Mr. Upson is particularly interested in the course in paper-making included in the college curriculum.

The paper-making school in the New York State College of Forestry is nationally recognized as one of the best-equipped and best-staffed of its kind in the world. Its finely-equipped laboratories play an important part in the paper-making courses. Students are given both technical training and practical experience in paper-making and its graduates are filling many important executive positions in the paper manufacturing field.

MINNEAPOLIS—Two-way radio is coordinating and expediting a major log drive this summer for the Minnesota and Ontario Paper Company near the Minnesota border in Ontario, it was reported this week by R. W. Andrews, vice-president in charge of production. This is the first time in the history of logging that FM has been used to establish communication among widely disbursed logging units engaged in the summer movement of thousands of cords of pulpwood for paper and insulation board according to Mr. Andrews and the General Electric Company, manufacturers of the electronic equipment.

Use of radio, made possible by four portable stations housed in trunk units at strategic points near the Minnesota border in Ontario, is aiding greatly the yearly battle against nature's water levels and headwinds, Mr. Andrews said.

"Thousands of cords of pulpwood must be rounded up from many lakes and herded through a labyrinth of rivers, lakes and dams to arrive eventually at mills. The harvest of pulpwood begins with the spring thaw and ends with the winter freeze up. It is a battle against time which radio is helping immeasurably," Mr. Andrews said.

Basis of the novel use of radio is a recently-installed FM network link between the company's mills at Fort Frances, on the International Border, and Kenora, in the Ontario province of Canada, 93 air-miles to the north. Transmitters and 300-ft. steel antennas are located at each site.

To completely cover the area, two relay stations were established about 60 miles from each station. The four key stations made it possible for nine radio-equipped logging camps scattered throughout the surrounding area to send and receive messages, either by direct communication or by relay, to any of the other stations in the network.

The portable stations for the log drive by radio are a 60-watt G-E, FM transmitter and receiver, shock mounted in a small, taxi-size wardrobe trunk. When the trunk lid is open a contact

(Continued on page 22)

Consolidated Mills Run at Capacity

WISCONSIN RAPIDS, Wis.—The various divisions of Consolidated Water Power and Paper Company are operating at capacity, with the two new machines at the Wisconsin River division at Stevens Point producing about 100 tons of coated paper daily, George W. Mead, president, reported at the annual stockholders' meeting here July 23, in the main offices here.

He said that the new boiler house at the Biron division is in operation, and the new paper machine there is expected to be operating in autumn.

When Consolidated acquired the Wisconsin River division in August, 1945, the daily output was 60 tons of newsprint.

Stanton W. Mead, vice president and director of manufacture, reported on the labor situation and increased labor costs, and discussed the pulpwood supply. Walter L. Mead vice president in charge of sales, discussed efforts to supply customers and create good will.

William F. Thiele, chief engineer, reported that increased demands for power had been met thus far.

Directors were reelected: George W. Mead, Stanton W. Mead, Walter L. Mead, Theodore W. Brazeau and Ralph R. Cole. Officers also retained their posts. In addition ot those named, they are: Mr. Cole, secretary and treasurer; Thomas A. Duda, controller, and Earl A. Starks, assistant secretary.

Aerial photographs of Consolidated's timber holdings and logging camps in northern Wisconsin and upper Michigan were shown at the stockholders' meeting. E. B. Hurst, chief forester, explained that these pictures are used in conjunction with cruising for mapping of timberlands.

Watson Devotes Attention To Franklin Interests

HOLYOKE, Mass.—George C. Watson of Holyoke, who has sold the Perkins Tissue Mills, Ltd., of Montreal, to Philip H. Scowan of the Brompton Pulp and Paper Company of Canada, will now confine his industrial work to the positions of president and treasurer of the Franklin Paper Company of this city. He acquired the Perkins plant in Montreal in April, 1935. Since that time he has divided his time between this city and Montreal, spending every other week in the latter city. He was president and treasurer of the Perkins Tissue Mills, Ltd., and developed that concern to sales of $1,000,000 annually and 90 employees.

The plant was first established in 1930 by the Perkins Tissue Mills of this city to be its Canadian branch. Benjamin F. Perkins sold it in 1935 to Mr. Watson.

May Sales Estimated At $5 Hundred Million

WASHINGTON—Sales by pulp, paper and paperboard manufacturers for May are estimated at $473,000,000, according to preliminary figures released by the Office of Business Economics of the Department of Commerce, 34 percent above estimated sales of May, 1946, and 0.6 percent below sales for April this year.

Total inventories in the industry, on a dollar basis, at the end of May, are estimated at $590,000,000, thirty percent above inventories of last year, and $20,000,000 above April 1947, inventories.

The increases in sales and inventories, said the agency, reflect increased volume of product as well as prices. Increased inventories are made up principally of increased pulpwood and waste paper inventories as wood pulp inventories are below those of last year.

Pulp, paper and paperboard prices have all increased in the last year with the composite index of pulp, paper and paperboard prices in May 34 percent above May 1946, and 1.2 percent above April, this year.

Hammermill Conference Set for August 21-22

ERIE, Pa.—The thirty-fourth conference with Hammermill agents will be held at the Kahkwa Club, August 21 and 22. Preceding the general session will be a meeting of the agents' advisory committee with mill officials on Wednesday afternoon, August 20.

Except for its wartime interruption in 1943 and 1944, this meeting has been an important mill and merchant conference in every year since 1912. The 1946 meeting was attended by a record number of 190 paper merchants. Hammermill anticipates that attendance of its domestic and foreign distributors at this year's meeting may top the 1946 figure.

Cockletone Bond, Hammermill's new tub-sized and air-dried paper, will be one of the important topics at this year's meeting. Hammermill's $6,500,000 expansion program, now nearing completion, will also be discussed.

Ozalid Calls Conference On Problems of Policy

BINGHAMTON, N. Y. — The Ozalid Products Division of General Aniline & Film Corp. will gear its production and sales policies to the international economic situation at a conference in October. About 300 representatives of the division and its allied producers and distributors will attend with at least twenty foreign nations represented. The conference will fix sales and production programs on an international basis for the next year.

O. B. Andrews Steps Up Output 20 Per Cent

CHATTANOOGA, Tenn.—According to J. V. Spachner, chairman of the board, O. B. Andrews Company, production has been stepped up 15 to 20 per cent and additional equipment is being installed in the plant here at an estimated expenditure of between $40,000 and $50,000. Mr. Spachner, vice-president and a director of the Container Corporation of America, Chicago, which recently purchased the shares of O. B. Andrews Company stockholders, returned to his headquarters July 29 after spending several days in Chicago.

"Business without question is improving and the outlook is definitely brighter in this section and over the country as a whole," Mr. Spachner declared. "Demand for products of the container industry has held up well and we believe that it will continue to do so. We are increasing production to meet increased demand."

He went on to say that the hours of work a week for the plant here have been increased and that some new equipment is being added in both the box-making and paper mill departments.

Container Corporation of America announced that in purchasing the shares of the O. B. Andrews Company in Chattanooga, the policies and organization would continue as in the past. George Boh continues as president and in charge of the local firm.

Midwest Finds Its Waste Paper Market Slow

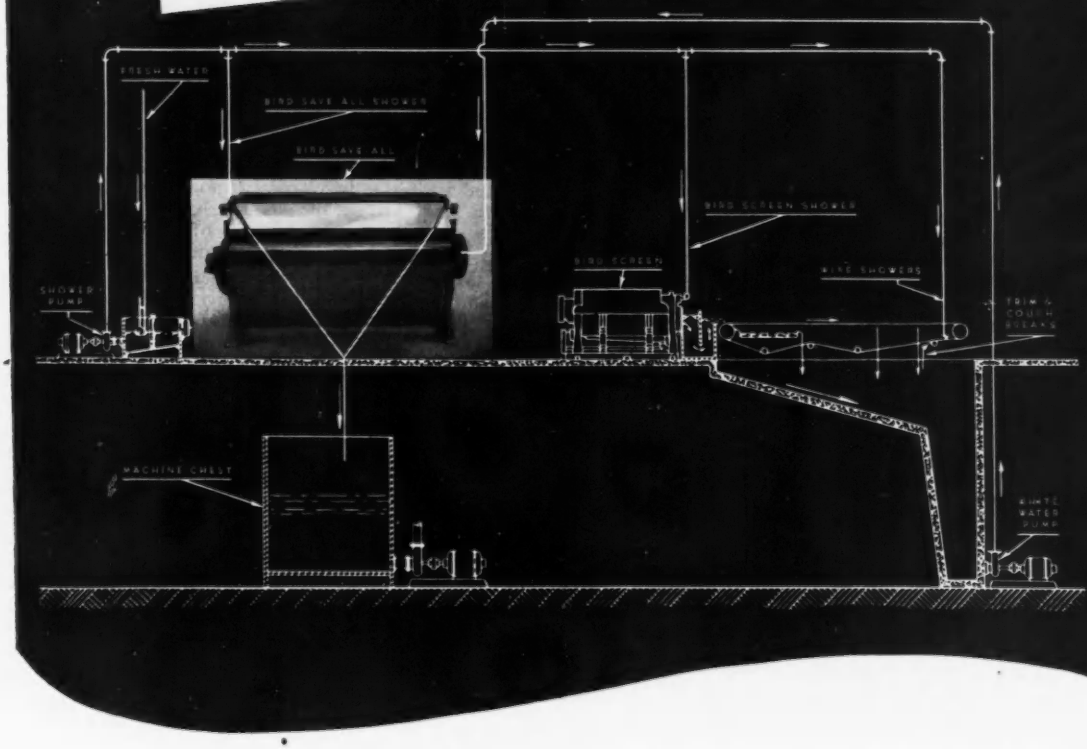
CHICAGO—Trading in waste paper in the Midwest area was reported as slow during the past week. Dealers and mills were said to be continuing to hold back awaiting announcement of prices for August. Meanwhile, quotations were nominally unchanged at $12 a ton for No. 1 mixed, $16 to $18 for No. 1 news and $30 for No. 1 old corrugated. Demand for the corrugated items, said local dealers, remained firm and there were indications, too, that the demand for news had improved somewhat over the situation a week ago.

North Tonawanda Promised Relief from Smoke Waste

NORTH TONAWANDA, N. Y.—Installation of a $165,000 electronic precipitator to remove waste materials from gases discharged from the International Paper Company's smoke stack eventually will eliminate the soda ash which has been annoying residents for several months. This statement was made by Stuart Kay of New York City, the company's manufacturing manager, who spoke at a public hearing on the matter in the North Tonawanda Council chamber.

A BIRD SAVE-ALL System Like This

Means More Paper, At Lowest Net Cost Per Pound of Fibre Recovered



Now is the time when a simple, practical system like this is worth its weight in gold. It quickly pays for itself in fibre and water savings and it effects substantial operating savings as well. There's no piling up of broke when starting up, and no shutting down to change the deckle. All the wet stock as well as white water is simply run through the Bird Save-All. Water can be closely controlled and reused, too.

Why not check your present layout against this system and call us in if you have any questions?

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Pacific Mills Will Develop Town Site

VANCOUVER, B. C.—Harold Falls is now townsite manager of the company town of Pacific Mills Ltd. at Ocean Falls, British Columbia. He has a staff of two stenographers and 75 workmen to assist him in the continued development, maintenance and administration of the town.

Mr. Falls points out that as there are no real estate agents in Ocean Falls every home has the exact number of residents for its size. The house has been erected in accordance with the actual requirements of families.

The town of Ocean Falls is two-thirds of a mile in length and 700 feet wide. It can not be extended further back into the mountains but the new site has been found northward of the present location.

There are approximately 2500 inhabitants at Ocean Falls, of which 1300 are employed at the pulp and paper plant of Pacific Mills. When any of the employes require any service in their home, such as new fuses, plumbing repairs, adjustment in the heating system, etc. they telephone the office of the town site manager and a repair man is immediately sent out. There is a company doctor and a company dentist. A hospital is operated and there is also a new pharmacy just established.

Pacific Mills Ltd. have been engaged in an extensive expansion program at the town site. The new company hotel with 200 rooms for single workers is now nearing completion and is one of the finest hotels to be found in any industrial community in Canada, comparing favorably with the larger commercial hotels in much larger centers.

Duplex homes and individual residences, as well as an apartment house for girl employes are all being erected in the town.

One of the features of Ocean Falls in the past was a plank roadway which has possibly been photographed by hundreds of thousands of tourists from all parts of the world. This rather unique highway is now being torn up and a cement road put in, in keeping with the modern new hotel which stands beside it. Plank roads, however, still remain in other sections of the town. The only automobile traffic in Ocean Falls are the company trucks, and it is believed to be one of the few communities in the world that has never had a traffic collision recorded.

Lightning Cuts Power At Niagara Mill

NIAGARA, Wis. — A shutdown resulted at Kimberly-Clark Corporation's mill here because of lightning Saturday evening, July 26. The lightnnig hit a power line near the plant and followed it into the mill. The switchboard was ignited and the mill's power was shut off. Repair crews started work at once, and operations were resumed July 30. Company officials said that it may be weeks before an accurate estimate of the loss can be made.

Crystal Tissue Names Three New Officials

MIDDLETOWN, Ohio — The board of directors of the Crystal Tissue Company, effective August 1st, has named George B. Tyler, for many years head of the cost department, assistant secretary of the company. Calista Van Horn has been appointed assistant treasurer, and W. Homer Boxwell becomes office manager, in addition to his work as purchasing agent.

Mr. Tyler, who resides in Excello, has been employed by Crystal for nearly 25 years. He attended Middletown High School and the University of Cincinnati.

Miss Calista Van Horn, who becomes assistant treasurer, is a graduate of Middletown High School and has served at Crystal in accounting work for more than 22 years. She is a member of the Business and Professional Women's Club.

Homer Boxwell is also a Middletown High School graduate. He is well known in Middletown as a steward of the First Methodist Church, and is a member of the Junior Chamber of Commerce.

Kimberly-Clark Golfers Get Together August 9

NEENAH, Wis. — The annual golf jamboree of Kimberly-Clark Corporation will be held Saturday, August 9, at the Springvale Golf Club at New London, Wis. Elmer Quayle again is general chairman. More than 200 entrants are expected from Kimberly-Clark plants at Niagara, Kimberly, Atlas Tag, Badger-Globe, Kimlark, Lakeview, Main Office and the Oshkosh Warehouse. It will be an all-day event, and there will be two refreshment holes. A country-style roast beef dinner will be served after which prizes will be awarded.

The annual K-C tournament started July 29, with competition in five flights. Eighty golfers were entered. Final round matches must be completed by August 25. Entrants arranged with their opponents for time and place of the matches.

Consolidated Builds New Spillway

STEVENS POINT, Wis.—A new spillway is being constructed at the west end of the Stevens Point dam of Consolidated Water Power and Paper Company by a crew of 35 workmen. The project is scheduled to be completed in mid-September. The new concrete spillway is being built about six feet downstream from the present spillway, which is about 300 feet long.

Ralston Concentrates At Old Bridge Plant

NIAGARA FALLS, N. Y. — The local plant of W. Ralston and Company, Inc., will soon be closed, and its operations consolidated with those of the company's new and modern plant at Old Bridge, N. J.

The company was founded in England in 1881, but operations were transferred to the Niagara Falls plant in 1916, when the local plant was said to be one of the most modern plants of its kind in the world. Specializing in the manufacture of waterproof papers, case liners, wax papers, oil papers and waterproof boards, the company stepped up its production here from ten tons per week to 250 tons per week in 1917.

Founded by George Chadwick, who died in 1941, the firm is now managed by George W. Chadwick, son of the founder.

Extensive properties were acquired by the company at Old Bridge in 1941. A laminating machine, said by company officials to be one of the largest in the country, has been installed there. It is capable of producing paper up to 108 inches in width.

A spokesman for the company said that opportunity has been given to all employes to move with the plant. Those employes who do not choose to move with the plant will be given separation bonuses, a company official said.

No definite date for moving has been established, although company officials say that the moving will take place "some time this year."

Neenah Workers Win Eight-Cent Increase

NEENAH, Wis.—An eight-cent hourly wage increase, retroactive to June 2, and three paid holidays — Christmas, July 4 and Labor Day — have been granted to Badger-Globe and Lakeview mill workers by Kimberly-Clark Corporation, under an agreement with Papermakers Union 467 and Local 482 of the Pulp and Sulphite Workers, both AFL, it was announced last week. The increase raised base pay from 98 cents to $1.06 per hour.

Appleton Ships First Grinder To Czecho-Slovakia

APPLETON, Wis.—The Appleton Machine Company has shipped a Roberts Grinder to Czechoslovakia. The pulp grinder weighs nearly 90,000 pounds and stands more than twice as high as a man, and had to be dismantled and shipped in four different crates on two flat cars. The Appleton Machine Company is the sole licensed builder of this grinder in the country, and the machine just shipped is the first to go to a foreign country. Two others, now in construction, will go to Norway when completed.

INTERESTING FACTS ABOUT PAPER!

The human voice can now be recorded on inexpensive paper tape. The tape is coated with an iron-oxide emulsion, can be used over and over, is easily mailed, and can be "erased" by the use of a magnet.

INTERESTING FACTS ABOUT AURAMINE OO

Auramine OO is a basic dyestuff of pure, clear yellow hue. It possesses excellent solubility and is adapted for all types of coloring—beater, calender, dipping and coating. It is extensively used for bond, blotting, cover, tissue, wrapping, news and poster, and boxboard both as a self shade and for topping acid and direct colors to obtain brightness. It is excellent on bleached and unbleached fibers.

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Wisconsin Traffic Men Meet at Port Edwards

PORT EDWARDS, Wis. — Executive representatives of sixteen Wisconsin paper and pulp mills and three staff members of the Wisconsin Paper and Pulp Manufacturers' Traffic Association met in the Conference Room of the Nekoosa-Edwards Paper Company offices on Monday afternoon, July 28, for a general discussion of the current traffic situation.

Operating problems from the manufacturers' standpoint were discussed, and various suggestions were presented by the member executives for alleviating certain existing obstacles and problems facing the traffic departments of the various member mills.

Following the business session, the visiting mill men were guests of John E. Alexander, president and general manager of Nekoosa-Edwards, at a cocktail hour at his summer home at Nepco Lake which was followed by a dinner at the Paper Inn at Port Edwards.

Executive representatives attending the meeting included N. H. Bergstrom, Bergstrom Paper Co., president; W. L. Thornton, Jr., Kimberly-Clark Corp., vice-president; John E. Alexander, H. F. Fredlund, S. A. Casey and Vivian Johnson of Nekoosa-Edwards; Stanton W. Mead, Consolidated Water Power and Paper Co.; J. C. Justeson, Mosinee Paper Mills; O. W. Johnson, Rhinelander Paper Co.; John White, Wausau Paper Mills; A. J. Schierl, Whiting Plover Paper Co.

W. Irving Osborne, Jr., Cornell Wood Products Co.; W. F. Kerwin, Hoberg Paper Mills; D. K. Brown, Neenah Paper Co.; E. C. Hilfert, Riverside Paper Corp.; Franklin Otis, Gilbert Paper Co.; C. B. Anderson, Central Paper Co.; R. W. Mahoney, Appleton Coated Paper Co.; G. D. Muggleton, Combined Locks Paper Co.; William Wright, Kimberly-Clark Corp.; John Maloney, Hoberg Paper Mills. J. E. Bryan, secretary-treasurer of the Wisconsin Pulp and Paper Manufacturers' Association, was also present and was accompanied by J. B. Chamberlain and J. E. Hart.

Civic Group Will Consider Wisconsin Valley Problems

WAUSAU, Wis.—Representative Reid F. Murray, representing the Seventh Wisconsin Congressional district, is scheduled to attend a meeting of the Wisconsin Valley Research Council, tentatively arranged for August 19 in this city.

The council was formed last February to study freight rates which it termed discriminatory against the Wisconsin river valley. The aviation and transportation committee of the Stevens Point Chamber of Commerce said that it would call on delegates from Wausau, Marshfield, and Wisconsin Rapids to plan an organization meeting soon. Twenty civic units from the area have appointed delegates to the meeting, aim of which is to establish a permanent area-wide action group.

Keith Staff Plays At Annual Picnic

TURNERS FALLS, Mass.—The sixth annual outing of the Keith Paper Company was held recently at the Schutzen-Verein club on the Connecticut river. A roast beef dinner was served to 300 employes and their families. A program of sports was carried out during the day under the supervision of various committees.

Arrangements for the outing were under the supervision of Gordon Bullar, finishing department foreman, and Fred Klaiber, head shipper. The committees and their chairmen were as follows: Dinner, Mrs. Gladys Courtney, chairman; men's sports, Earl La Pierre, chairman; women's sports, Helen Bacon, chairman, and entertainment, Fred Stroble.

One of the highlights of the day was a ball game between the men and the women. The men batted left handed and were defeated by the weaker sex, 6-0.

There was a quantity of food remaining and this was donated to the Farren Memorial hospital.

Kimberly-Clark Staff Plays for a Day

NEENAH, Wis. — The annual Kimberly-Clark family picnic sponsored by the Kimberly-Clark Activities Committee was held August 3, in Riverside park. The day included free acts, dancing, rides, children's races, baseball games, prizes and free refreshments. Elmer Sievert was the general chairman. A first aid tent was set up on the grounds and nurses were on duty all the day.

Alexander Plays Host To Nepco Foremen

NEKOOSA, Wis.—John E. Alexander, president and general manager of the Nekoosa-Edwards Paper Company, was host to foremen and supervisors of the company at their annual picnic August 3 at his summer home, Ardor Lodge, on Nepco lake. More than 100 were present. There was speedboat and aquaplane riding, swimming, cards and refreshments during the afternoon, followed by a chicken chowder supper.

Marathon Golfers Schedule August 7 for Tournament

MENASHA, Wis.—Marathon Corporation's annual golf jamboree was scheduled for August 7, at Ridgeway Country Club. Ed Christense was general chairman, and Louis Dennis and Cliff Bauers were in charge of ticket sales. Golfers were to tee off at 3 o'clock in the afternoon, with awards for 18 holes and for 9 holes.

Lily-Tulip Sets Up New Sales Division

Frank T. Roche, sales manager of Lily-Tulip Cup Corp., this week reported two new sales divisions established in the Southeast. Because of the continuing growth and expansion of the Southeastern markets, the original Lily-Tulip Southeastern Sales Division is now realigned into two new divisions:

William Rigsby, formerly Southeastern Division manager, has been made manager of the newly created Carolina-Virginia Division which includes North Carolina, South Carolina and Virginia. Mr. Rigsby has been with Lily-Tulip for eighteen years and will now devote full time to the management and development of this important area. In this connection Mr. Rigsby has changed his headquarters from Atlanta, Ga., to Charlotte, N. C.

S. T. Tygart, formerly district manager for Florida, has been appointed division manager of the new Florida-Georgia Division. Mr. Tygart, originally from South Georgia, has been with Lily-Tulip since 1940 with successful sales experience in Georgia and Louisiana prior to his becoming district manager of the Florida territory five years ago. Mr. Tygart's headquarters continues at Jacksonville, Fla.

Protective Papers Opens Plant in Illinois

UNION, Ill.—Protective Papers, Inc., a new corporation, has been formed for the manufacture of industrial wrapping waterproof and greaseproof papers and specialty laminating. The plant location at Union offers an excellent location for rail and truck shipments to the midwest area. Products manufactured by the company will be marketed under the trade name Leatherback.

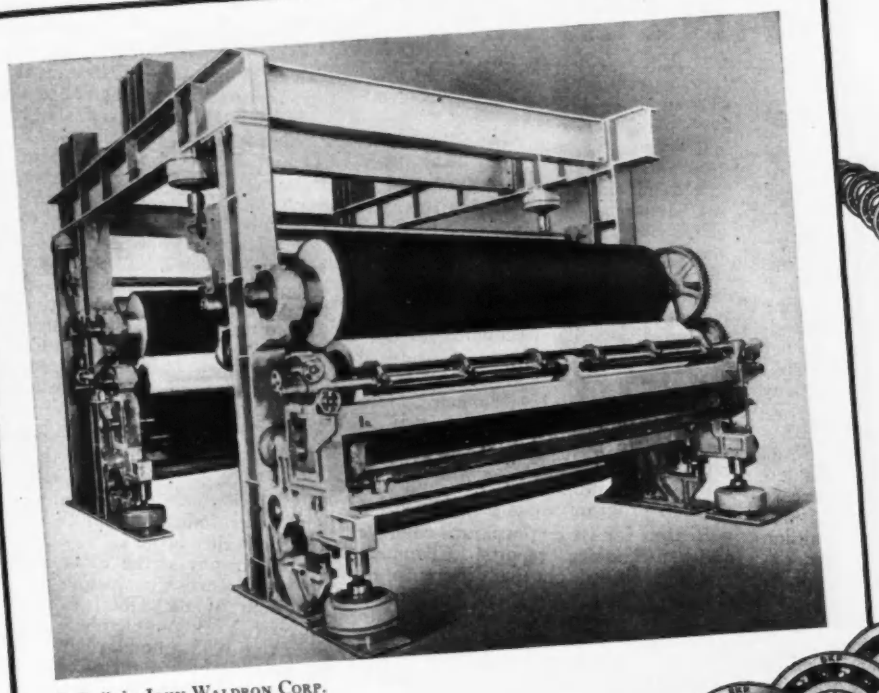
Officers of the new corporation are well known in the paper trade. R. F. Anderson is president; John Willy, vice-president in charge of production; James C. Taylor, vice-president in charge of sales; and Paul Sukup, secretary and treasurer.

Erickson Heads ACS Worcester Section

WORCESTER, Mass.—John R. Erickson, research chemist at the Norton Co., has been elected chairman of the American Chemical Society's newly-chartered Worcester section. The unit will be known as the Central Massachusets Section.

Roy C. Charron, research chemist at the United States Envelope Co., has been named to the National Council of the society.

Erickson, the section's first chairman, was graduated from Yale University in 1933 with the degree of Bachelor of Science in Chemical Engineering.



● *Built by* JOHN WALDRON CORP.

COATING PAPER AT 1500 F.P.M.

Filling a vital need in the Paper Industry, this "Synchro-set" unit is capable of coating paper on the paper machine at speeds up to 1500 feet per minute. And filling a vital need for carefree, steady performance on this machine are SKF Bearings at strategic rotating points. SKF Bearings easily absorb various combinations of radial and thrust loads. Other than infrequent lubrication, they need no attention. The trademark "SKF" is *your* assurance that the right bearing is in the right place.

6298

SKF Puts the RIGHT BEARING in the RIGHT PLACE

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

FINANCE

Champion Doubled Net In Its 1947 Report

CANTON, N. C.—The Champion Paper & Fibre Company in its 1947 annual report to stockholders, just released by Reuben B. Robertson, president of the company, reports earnings of $4.47 per share on outstanding common stock for the fiscal year ending 1947 as compared to $2.71 per share before a two for one stock split in 1946. Net profits for the company and its subsidiaries amounted to $5,375,644.94 in comparison with $2,057,442.52 in 1946. Net sales for 1947, as revealed in President Robertson's letter, were $67,611,197.21, an increase of $18,393,058.65. Capital expenditures were set at approximately $10 million with an extensive integration and expansion program accounting for a major portion of this amount.

Robertson said major phases of the expansion program were the addition of a new Fourdrinier paper machine, largest of its kind in the world for manufacturing fine papers, in the Canton division, and addition of a new department in the Hamilton division devoted exclusively to the production of Kromekote, the high finish coated paper made by a Champion developed process. Extensive construction also is in progress at Houston, Tex.

"The company's forestry program as outlined for the coming year," commented the Asheville Citizen, "calls for planting of 4,000,000 trees in company owned areas in the Carolina and Texas regions. Production records at each of its three divisions reached unprecedented heights."

Released simultaneously with the stockholder report was a special report to employes entitled 1947 Report to Champions. Theme of this report is "The Story of American Business Management." It is third of a series of recent issues aimed at more clearly defining the American free enterprise system and showing how the company fits into the national economic picture.

Officers and directors are introduced to the employes as being typical of the managers of American business. Management's responsibilities, position of employes in industry and the role of capital in business are discussed. The company's future prospects and expansion program are also outlined.

Reason for issuing separate employe and stockholder reports, Champion states, is based on the difference of primary interests of the two groups. Reports are being made available to members of both groups, however, as well as the general public in plant communities.

Hooker Withholds Shares

NIAGARA FALLS, N. Y. — Hooker Electrochemical Company of Niagara Falls has postponed indefinitely the offering of 110,000 shares of new cumulative preferred stock which had been planned for this month. An executive says the market "is not particularly propitious at the moment" and that the delay "will have some effect on the timing" of a planned $8,000,000 expansion program.

13 Reports Compete For "Oscar" Trophy

NEW YORK—The 1946 annual financial reports to stockholders of thirteen pulp and paper companies have been cited for excellence in the Seventh Annual Report Survey conducted by Financial World, national weekly magazine. They are those of Brown Company, Crown Zellerbach Corporation, Hammermill Paper Company, Hobert Paper Mills, International Paper Company, Kimberly-Clark Corporation, Marathon Corporation, Mead Corporation, Nekoosa-Edwards Paper Company, Oxford Paper Company, Riegel Paper Corporation, St. Regis Paper Company, and the West Virginia Pulp & Paper Company.

In the final judging to be completed by mid-September, one of these companies will be judged as having the best 1946 annual report of the pulp and paper industry, and then will be awarded the bronze "Oscar of Industry" trophy at the Financial World Annual Awards Banquet in the Grand Ballroom of the Hotel Pennsylvania in New York on October 10th. Last year the 1945 annual report of West Virginia Pulp & Paper Company won the top award in this classification.

More than 3,500 annual reports were entered in this year's competition, the largest in the series, according to Weston Smith, survey director.

The independent board of judges is headed by Dr. Lewis Haney, professor of economics, New York University, and he is assisted by Glenn Griswold, editor, Public Relations News; Sylvia F. Porter, financial editor, New York Post; Elmer Walzer, United Press Financial Editor, and Lester Tichy, industrial designer.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending Aug. 2, 1947

STOCKS

	High	Low	Last
A. P. W.	4¼	4⅛	4⅛
Armstrong Cork Co.	47¾	45¾	46½
Armstrong Cork Co., pf.	108½	107	108½
Celotex Corp.	28⅛	25¾	26¾
Celotex Corp., pf.	20½	20⅜	20½
Certain-Teed Products Corp.	17⅞	16	17
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	25⅜	23	24¼
Champion Paper & Fibre Co., pf.	107½	106½	107
Congoleum Nairn Co.	30¼	29	29¼
Container Corp. of America	44¾	42⅛	43
Container Corp. of America, pf.	104½	102	103½
Crown Zellerbach Co.	32⅛	29⅝	30½
Crown Zellerbach Co., pf. 4.20	107	106	106
Crown Zellerbach Co., 4 pf. 4	120½	115	116
Dixie Cup Co.	36½	35½	36¼
Dixie Cup Co., A	54	53	54
Flintkote Co.	33⅝	31½	33⅛
Flintkote Co., pf.	107½	106¼	107½
Robert Gair	9⅛	8¼	8⅝
Robert Gair, pf.	20	19⅝	20
International Paper Co.	50⅛	46	48
International Paper Co., pf.	106¾	106¼	106¼
Johns-Manville Corp.	45	43⅛	45
Johns-Manville Corp., pf.	121¼	120½	120½
Kimberly-Clark Corp.	25⅝	23⅝	24⅝
Kimberly-Clark Corp., pf.	109⅞	108½	108½
Mac Andrews & Forbes	39¼	38¼	39¼
Mac Andrews & Forbes, pf.	151	148•	148
Marathon Corp.	25½	23	24
Mead Corp.	22¼	20	20½
Mead Corp., pf. 4¼	99¼	99	99
Mead Corp., pf. 2	46¼	46¼	46¼
National Container Corp.	41⅞	39½	41¾
Paraffine Companies, Inc.	....	....	....
Paraffine Companies, Inc., pf.	68	66	66
Rayonier, Inc.	26¼	24⅛	25¼
Rayonier, Inc., pf.	37¼	36½	36½
Ruberoid Co.	60½	56¾	58
St. Regis Paper Co.	11⅛	9⅞	10½
St. Regis Paper Co., pf.	98	98	98
Scott Paper Co.	47	46	46
Scott Paper Co., pf.	101¼	100½	101¼
Sutherland Paper Co.	42	41	41
Union Bag & Paper Corp.	35¼	32¾	34⅛
United Paperboard Co.	15¼	14½	15¼
U. S. Gypsum Co.	103½	98½	100½
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	110½	110	110
West Virginia Pulp & Paper Co., pf.	42½	40	40

BONDS

Abitibi Pulp & Paper Co., 5s '53	....	....	....
Celotex Corp., 3¼s '60	....	....	....
Certain-Teed Products Corp., 5½s '53	....	....	....
Champion Paper & Fibre Co., 3s '65	....	....	....
Mead Corp., 3s '66	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending Aug. 2, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	47	43¾	46
Taggart Corp.	10	9⅞	10

BONDS

American Writing Paper Co., 6s '61	....	....	....

The New VALLEY VORTEX Pulper

A prominent paper mill, considering the purchase of four Valley Vortex Pulpers, wrote the following after witnessing a demonstration and getting first-hand knowledge of the machine's high production capacity:

"We were very favorably impressed with operation of your machine; so much so that we believe three units will handle the production which we had contemplated for four . . . and we are accordingly placing our order for three machines."

We cite this case to emphasize the extraordinary cost-cutting ability of this powerful pulper. Let us show you how the Valley Vortex Pulper can save money for you, too. We'll be glad to have you write us.

VALLEY IRON WORKS Company

Powell River Profits Go Above $5 Million

VANCOUVER, B. C.—Powell River Company Limited, reports consolidated profit after depreciation, but before provision for taxes, at 5,444,606 for the first six months of 1947. It compares with $3,001,909 in the same period 1946. Net profit after providing $2,382,500 for taxes, amounted to $3,062,106, or $2.28 per share. Net in same period last year was $1.26 a share.

Gains in production of newsprint, pulp, wrapper and laminated products, are reported by Harold S. Foley, president. The Directors have adopted the policy of distributing 60 per cent of earnings in dividends. To June 30 this year $1.15 per share has been paid.

Capital expenditures for 1947 are estimated at $4,432,000, with $1,781,510 spent in the half year. The management states that after the expenditures, 40 per cent of net earnings being retained, will preclude necessity for borrowing.

Newsprint production for the first six months of 1947 was 118,814 tons compared with 107,977 in first six months of 1946. Other products were as follows: "Pulp, 21,266 tons, compared with 14,947, wrapper, 2,848 tons compared with 2,202; and laminated products, 1,395 tons compared with 1,068.

Present indications are that new highs in production and sales would be accomplished in 1947, states the president. Present indications are that new highs in production and sales would be accomplished. Demand for all products continues to be in excess of production.

In a reference to the advance in price of standard newsprint to $90 per ton at major U. S. points and to the advance of the sulphite pulp price to $115 per ton, Mr. Foley says the net realization to the company, after freight and other charges, is considerably less. The price of newsprint, he states, is still 20 points below the wholesale commodity index price in the U. S.

Wages in the plant at Powell River were increased 12 per cent or 12 cents per hour, whichever is greater, by a new agreement reached in April. All the company's log producing companies are affected by a new agreement providing for a wage increase of 12½ cents per hour.

Consolidated Holds Up Common Dividends

MONTREAL—At the regular monthly meeting of the directors of Consolidated Paper Corporation, Ltd., the Board reviewed the etarnings for the first six months of the current financial year and declared a dividend of 50 cents per share payable September 20, 1947, to shareholders of record at the close of the business on August 7th.

The Board decided to defer, until the Corporation's tax position has finally been established, the initiation of regular dividend payments. In view of the progress of negotiations, it is anticipated that the Corporation's tax problems will soon be satisfactorily settled.

Rayonier's Net Up 50% at Half Year

NEW YORK—Rayonier Incorporated, manufacturer of wood cellulose pulps, reports for the six months ended June 30, 1947, net sales of 24,109,208 compared with $15,818,493 in the corresponding period of the previous year. Consolidated net profit after all charges, including federal taxes, was $3,845,080 against $1,022,676 and was equal, after preferred dividends, to $3.24 per share on the common stock compared with $.41 for the similar period in 1946.

President Edward Bartsch in his letter to stockholders, states that the wage pattern set by other industries compelled the making of further wage adjustments which were not in effect during the entire period covered by the report. These increased wage rates as well as higher wood and other raw material costs, necessitated an advance in selling prices, effective during July. He further states that the large unsatisfied demand for the company's products continues, and present estimates indicate that current operating results should be maintained during the remainder of 1947.

The consolidated balance sheet of the company as of June 30, 1947, shows current assets of $15,205,786 and current liabilities of $3,335,800.

Folke Sundblad Joins Gottesman Organization

NEW YORK — Folke Sundblad, well known throughout the pulp and paper industry, has joined the staff of Gottesman & Company, Inc., as manager of Research and Development. Mr. Sundblad will spend much time in Sweden and on the European continent, and is now abroad in connection with his newly assigned duties. Mr. Sundblad has a world-wide experience in pulp manufacture and distribution, having been associated for many years with some of the larigest United States producers of pulp. Before that, he had a thorough schooling in Sweden in both the practice and theory of pulp and paper making.

Niagara Alkali Seeks to Erect Two New Buildings

NIAGARA FALLS, N. Y. — Niagara Alkali Company has applied to the city division of buildings for permits to erect two structures for chlorinated solvents at an estimated cost of $110,000. The buildings will be erected on Adams Ave. One will be 30 by 64 feet, the other 50 by 100 feet. Both will be one-story.

St. Lawrence Group Reports Half Year

TORONTO—The three companies associated with St. Lawrence Corp. reported higher gross earnings for the first half of 1947 than for the same period last year.

Brompton Pulp & Paper Company Ltd., listed gross of $1,681,450 for the half-year ended June 30th, as compared with $662,775 in the first half of 1946. Deductions for interest, depreciation, depletion and reserve for taxes left a balance of $672,651 available for dividends, equivalent to $2.24 per share. Out of these earnings, $150,000 was disbursed in dividends, leaving a balance of $522,651 for the half year. Net working capital increased from $2,420,680 as of Dec. 31, 1946, to $3,048,402 as of the end of June.

Gross earnings of St. Lawrence Paper Mills Company, Ltd., for the first half were $1,980,053, compared with $1,038,185 for the six-month period of last year. To this must be added dividends of $108,000 received from the company's holdings of preferred stock of Lake St. John Power and Paper, and $367,000 dividends from its holdings of that company's common stock. This increased revenues of the company to $2,347,053. After depreciation, depletion and estimated taxes, net earnings amounted to $1,287,053, equivalent to $10.30 a share on the outstanding preferred stock. After preferred dividends of $686,862, including $3 a share on account of arrears, there remained a surplus of $600,191. Net working capital as of June 30, 1947, was shown at $5,947,871, as compared with $4,948,028 at the end of 1946.

For the period Lake St. John Power and Paper Company had gross of $1,845,740, against $1,117,890 in the first half of last year. Bond and debenture interest, depreciation and depletion and estimated taxes absorbed $1,040,185, leaving balance available for dividends of $805,555, equal to $44.75 per share on preferred, and to $6.97 a share on the common stock. In the six-month period, the full 6 percent preferred dividend for the year of $108,000 was paid, and $300,000 was distributed on the common, after which there remained a surplus of $397,556 for the half year. Net working capital increased from $3,238,778 at Dec. 31, 1946, to $3,600,438 at June 30, 1947.

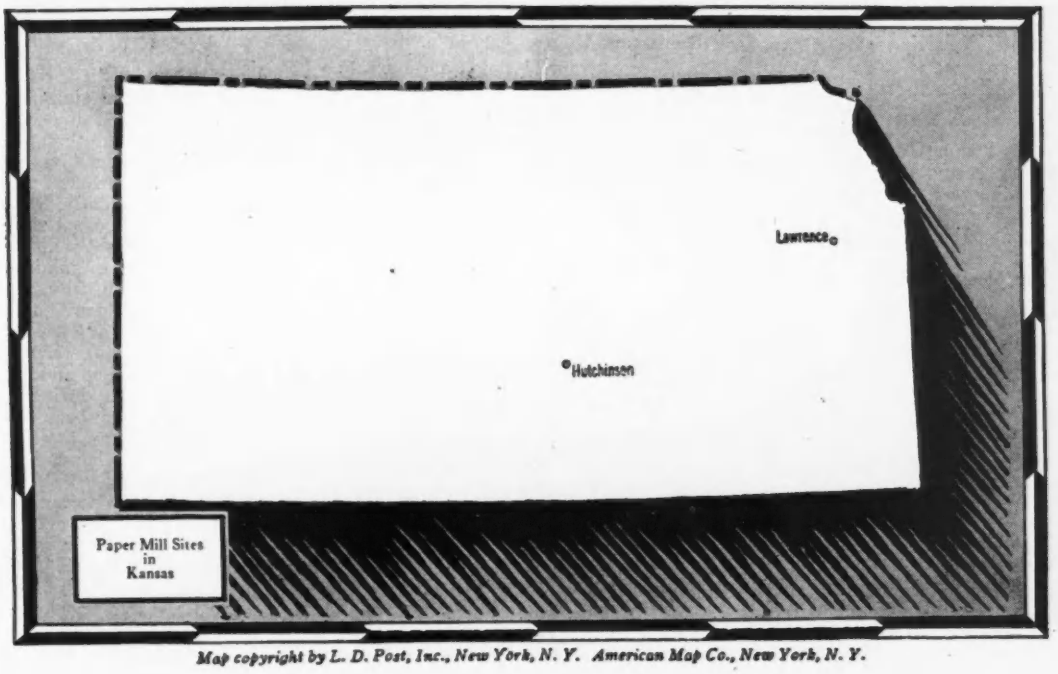
Cosler Off to Japan On Paper Assignment

NEW YORK — Arthur S. Cosler who recently returned to this country from a post that involved supervision of paper mill properties in the American Zone in Europe has again gone abroad for the Army Occupation Forces. After a pause for conferences in Washington he flew west and departed from that coast for similar duties in Japan.

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 34 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS



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HIGHLIGHTS: Kansas was not designed by nature for papermaking. It grows no woods suitable for pulp; it consists largely of rolling prairie land offering poor opportunity for water-power. It does produce some coal and natural gas. Its only native fibrous products adaptable to papermaking are oat and rye straw. If cornstalks ever become economically practical, the large annual crop in Kansas will be available.

At present the rated daily capacity of the two paper mills in the State is only 300,000 pounds. The largest of these plants makes chip board, egg case board, filled news board and straw board on one four-cylinder and one seven-cylinder machine. The other, on one six-cylinder machine, produces 30 tons daily of jute liners for corrugating and corrugated shipping containers.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST, PITTSFIELD, MASS. — WILLIAM N. CONNOR, Jr., CANTON, MASS. — L. H. BREYFOGLE, KALAMAZOO, MICH. — WALTER A. SALMONSON, 519-20 WHITE BLDG., SEATTLE, WASH. — L. L. GRIFFITHS, Jr., KALAMAZOO, MICH.

Text Book Sales Break All Records

NEW YORK—Sales of text books on the manufacture of pulp and paper during the first half of 1947 were nearly as great as during the previous all-time high in the full year of 1929. Purchases of 2,314 volumes during the past 6 months brings the overall total to 43,385 since publication of the first volume in 1921.

The figures reported by the McGraw Hill Publishing Company to the Joint Textbook Committee are as follows:

TEXTBOOK SALES

	1st Half 1947	Total To Date
Volume I	160	5,729
Volume II	171	4,986
Volume III	854	12,913
Volume IV	564	10,430
Volume V	565	9,327
	2,314	43,385

Volumes I and II deal only with the preliminary sciences necessary to the understanding of pulp and paper manufacturing processes, yet it is noteworthy that 331 copies were sold during the period. The widespread and continuing desire for further information upon how pulp and paper are really made is evidenced by the sale of 1983 copies of Volumes III, IV and V in the first half of this year, and a total of 32,670 copies since the original publication.

These three volumes have already undergone two revisions, so that it is the third edition which is now selling. Editorial work upon the fourth edition has long been under way, and it is hoped to bring it to a successful conclusion in 1948. This date will mark the passage of 30 years since the formation of the Joint Textbook Committee by which the original project was developed and under whose supervision it has been steadily carried forward.

Through the efforts of this Joint Committee which represents the entire North American pulp and paper industry, the textbooks have been kept abreast of a constantly growing industry and the revisions now under way make certain that all who desire to increase their knowledge of the many mechanical, chemical and technical processes involved will be afforded the latest and most authoritative information thereon.

Mengel Buys Nashville Corrugated Box Firm

NEW YORK — The Continental Can Company has sold the Nashville Corrugated Box Company to the Mengel Company. The Nashville plant will continue to operate as a separate corporation, and William A. Puryear will continue as vice-president and manager. The Mengel Company, a pioneer in the use of paperboard made from southern chestnut and pine, has plants at Louisville, Winston - Salem, New Brunswick, N. J., and Fulton, N. Y.

Gurley's New Tester Measures Stiffness

TROY, N. Y.—A new motor-driven stiffness tester, designed for rapid, consistent and accurate tests on paper, fibre products, foil and other thin flexible sheet materials has been developed by W. & L. E. Gurley, century-old manufacturer of scientific instruments. The tester measures the stiffness, or absence of it, of practically any thin flexible sheet material, and its capacity is from light tissue paper up to the heaviest single sheet boxboards in common use. Such paper products as boxboards, playing cards, bristols, bonds and ledgers can be tested.

More convenient than hand-operated instruments, the Gurley stiffness tester has a balanced pointer which pivots in jewel bearings, and moves parallel to a sine scale mounted on the base. It is loaded below the center with weights of 5, 25, 50, or 200 grams, fastened 1, 2, or 4 inches from the pivots. The arm carrying the sample being tested is moved by a small-geared synchronous motor which is controlled by a reversing switch on the base.

To make a test a sample is first cut to a standard width and length, clamped in a movable clamp so that the free end overlaps the top of the pointer by ¼ inch; and pressed against the top of the pointer until it is bent sufficiently to assume a short arc, shortening it by the quarter-inch overlap. The pointer is then automatically released. The greatest reading of the pointer against the sine scale is averaged in both directions, to eliminate any effects of curl, and may be multiplied by a factor applying to one of 144 combinations of sample and loading weight. The product is expressed as the stiffness of the sample.

In addition to paper products, the Gurley stiffness tester can accurately show the degrees of stiffness for such products as shoes, handbags, coated textile fabrics, raincoats, baby pants, and chewing gum. Finishings of varnish, paste, lacquer, glue, wax paraffin, water-proofing, glycerine, oil or other plasticizers can also be precisely measured and evaluated.

Hammermill Names Young As Finishing Chief

ERIE, Pa. — Robert S. Young has been appointed superintendent of the finishing department of the Hammermill Paper Company, succeeding Percy Wilson who has retired after 38 years of service. Mr. Young is a veteran of 30 years employment with the company and for the last two years has been assistant superintendent of the paper mill division.

Salesmen Hear About British Conditions

A. G. Shennan, vice-president of the International Tax & Salesbook Company and until recently president of the Chicago Rotary Club, was the featured speaker at the last July meeting of the Western division, Salesmens Association of the Paper Industry. Mr. Shennan gave a most interesting account of his six weeks' trip to England.

Himself an Englishman, Mr. Shennan gave a graphic account of the serious situation now confronting the English along the political and economic front. The speaker said the country really was in serious difficulties and that people in America had no idea how hard the British were working to solve the problems confronting them on all sides.

In coal mining, for example, Mr. Shennan pointed out that the present problem was one of many years standing, grown worse through an accumulation of both economic and mechanical difficulties. He described the shallowness of the English strip mine, the physical difficulties of mining and the general effect of this situation on the English social problem. As far as the paper and allied trades are concerned, Mr. Shennan said that converters were still on the 60 percent allocation basis which was in effect during war time and added that "you can't do much with rations such as that." A good attendance was on hand, including a number of guests.

The SAPEYES also announced the winners of the July 18 golf outing at Briergate with Ed Rolain winning low gross and John Stobbie high gross. Arthur Brown captured first low net while Jack Hanson was low on number of putts. The next outing is at the Medinah Country Club August 8.

OBITUARY

Frederick E. Willers

NIAGARA FALLS, N. Y.—Frederick E. Willers, 63, a resident of this city for the last 59 years and an executive at the Mathieson Alkali Works, Inc. for a number of years, died at his home, 1643 Michigan avenue, after being in poor health for the last year.

Born at Detroit, Mr. Willers started work at Mathieson's in 1902 as a laboratory boy. During the 45 years of his service there he was successively promoted and at the time of his death he was superintendent of the chemical high test department. In point of service he was believed to be the second oldest employe at the plant. He was a member of the Chamber of Commerce.

Mr. Willers is survived by his wife, Laura; two sons, Thomas F., this city, and Edison G., Aberdeen, S. D.; two sisters, Freda Willers and Mrs. Anna L. Panter, and four grandchildren.

Turbine Drive

High Accuracy (± 0.1 per cent)

Wide Speed Range (as high as 30 to 1)

Here's good news for users of mechanical-drive turbines! To meet the demand for a more accurate method of controlling drive speeds on paper machines, General Electric announces a new turbine drive—electrically controlled. In accuracy, speed of response, and simplicity of maintenance, this drive with the new electric governor is miles ahead of anything that has been used in the past.

How accurate is it?

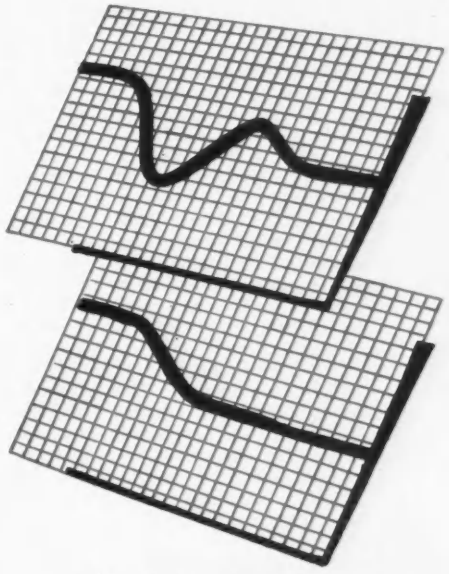
Field tests show that the new governor will hold turbine speed to 0.1 per cent of the desired setting under constant steam and load conditions. Speed change can be accomplished smoothly and easily.

How wide a speed range?

Though you may not want to operate your machines over such a wide speed range, this new G-E governor makes possible as high as 30 to 1 variation in drive speeds. By providing accurate speed control throughout this range, the governor adds versatility to your paper machines—enables them to handle "special" jobs with ease.

The new General Electric turbine governor is well protected against wear and tear in operation. All important elements are safely housed in protective enclosures which will not corrode in damp atmospheres. Properly installed, the governor operates indefinitely without special attention. The mechanical-drive-turbine specialist in your local G-E office will be glad to give you complete details. Call him today! Or write for the bulletin. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

PAPER-MACHINE DRIVES



TAKES THE "JITTERS" OUT OF TURBINE CONTROL

These two charts illustrate how a General Electric turbine governor adjusts speed smoothly and at a uniform rate. Formerly, turbine speed, particularly when changed, had a tendency to fluctuate above and below the desired level for a considerable period. While this "hunting" continued, paper thickness varied far beyond the set limits. The new governor enables a turbine to come up or down to speed smoothly and quickly and hold that speed constantly.

APPARATUS DEPT., SEC.. C 663-26
General Electric Company
Schenectady 5, N. Y.

Please send me Bulletin GEA-4764, on the electrically-governed turbine drive.

Name.....

Company.....

Address.....

City.....State.....

Westminster Modernizes Plant To Increase Its Capacity

VANCOUVER, B. C. — Development of the operations of the Westminster Paper Company Ltd. at New Westminster, B. C., presents an extremely interesting story, in which many of the usual principles in extension of Canadian firms have been reversed, the most outstanding being the setting up of a branch by this Canadian company in the United States.

John J. Herb, founder of the New Westminster Paper Mills, started as a sweeper at the age of 15 in Thilmany Paper Mill in Kaukauna, Wis., and gradually climbed until in 1912 he held the post of mill superintendent. He then moved to Thorold, Ontario, and was associated with the building of the Interlake Paper Mill at Merritton, Ontario, where for ten years he was mill manager. Part of his business was associated with sales and he studied the market from coast to coast. Realizing that western Canada presented a specialized outlet, and somewhat of a problem from the viewpoint of service from eastern mills, he decided to establish his own western plant, and in 1922 launched the building of the first Westminster Paper Company Ltd. premises at New Westminster. The plant, when opened, employed 18 persons and had a capacity for processing about 175 tons of pulp per month.

The business expanded from the start, and by 1925 Mr. Herb had organized Pacific Coast Paper Mills at Bellingham, Washington, as a subsidiary to the Westminster Paper Company. This Bellingham operation has now become one of the most important of the secondary plants in the paper business on the U. S. Pacific Coast. Mr. Herb through this move became the first man to operate paper specialty manufacturing plants on the Pacific Coast on both sides of the international boundary.

In 1926 the New Westminster plant was extended and new equipment installed. Manufacturing of wax paper bread wraps was inaugurated and artists and an engraving department were added to the staff to design wrappers for the various bakeries and other food plants interested in the use of wax wrappers. From 1922 until 1929 the Westminster Paper Company's business rapidly expanded until a disastrous fire destroyed the plant in July, 1929. At this period the general depression also started, but New Westminster citizens came to Mr. Herb's assistance and started a bond issue which was guaranteed by the City of New Westminster in view of its recognition of the importance of this industrial operation to the city. The plant was rebuilt and production commenced in a new three-story building a year later. This building had 115,000 square feet of floor space and had 700 feet of waterfrontage on the Fraser River. In 1938 a three-story concrete addition was built to the plant which was shipping its products to export markets all over the world, as well as to other provinces in Canada.

At the outbreak of war this plant had 57 electric motors and two new boilers of 165 h.p. each, and was using 20 units of hog fuel daily. The plant was employing 150 men and women and had an annual payroll of $186,000, while its annual raw material purchases totaled $724,000. Plant production was 50,000 pounds of paper daily.

At that time the company planned expansion to cost $1,250,000. This involved construction of a two-story, reinforced concrete and steel fireproof building, 85 by 225 feet. Installation of a new paper machine and erection of a three-story building, 126 by 112 feet for storage, erection of a new wharf, enlargement of the boiler house, erection of new office buildings and transformation of original office premises into locker rooms and cafeteria was also planned. Contract was placed with the Dominion Construction Company Ltd., Vancouver, for design, engineering and erecting the new buildings. Contract was also placed with the Beloit Iron Works, Beloit, Wisconsin, for 132-inch wide Fourdrinier Yankee-type paper making machine. Alexander Fleck Limited, Ottawa, was awarded contract for the latest models of the Hydrapulper and Hydrafiners. Completion of these contracts and delivery of the new equipment was relaxed throughout the war years, but by 1945 four additional acres had been purchased and the new wharf had been completed with a Barlow marine elevator of five tons capacity installed. The new paper making equipment was delivered by the Beloit Iron Works and installed in the early part of this year. Meanwhile the original estimates had been increased to $1,750,000 to cover the expansion program. Now the plant is processing over 2,000 tons of pulp per month and has over 300 employees working on three eight-hour shifts to meet the unprecedented demand for its products.

The expansion program, as finally developed, involved expenditure of $1,000,000 for the new machinery, expenditure of $268,000 for new buildings, excluding the wharf and the purchase of land. The company is now planning reconstruction of its Number 1 Fourdrinier so that its speed and capacity will be equal to the Number 2 machine just installed.

Conservation Men To Meet at Crossett

ATLANTA — The summer meeting of the Southern Pulpwood Conservation Association will be held September 9 and 10 at Monroe, La., and the Crossett Forest Experiment Station, Crossett, Ark. The meeting is open to those interested in forestry.

Emphasis of the summer meeting will be on Cutting Practices. Wood shippers, foresters, landowners and others attending will derive much benefit from observing the results of various kinds of cuttings made on the Crossett Experimental Forest. Information on volume cut and left, costs and methods of production and utilization of products will be invaluable in comparing with your similar forest conditions, operations and markets.

On Tuesday, September 9, members and guests will register at the Hotel Frances any time during the afternoon. The evening activities, including banquet and short forestry program, will commence at 6 p.m. at the Hotel Frances. Everybody is on their own expense. Registration fee will include the cost of the banquet and fish fry the following noon.

On Wednesday, September 10, members and guests will assemble and leave Hotel Frances promptly at 8:00 a.m. for a field trip in individual cars. They will inspect two tracts, partially cut for pulpwood by producers, enroute to Crossett. One is a small landowner tract and the other owned by a sawmill company. Lunch will be at the Crossett Experiment Station. In the afternoon an inspection tour of the Crossett Experimental Forest will be conducted by Russ Reynolds and staff. The meeting will be concluded upon completion of the Forest tour.

Make plans to attend now. Write either the Hotel Frances or the Virginia Hotel, Monroe, La., for reservations. Further information may be obtained by writing to H. J. Malsberger, Forester and General Manager, Southern Pulpwood Conservation Association, 1501 First National Bank Building, Atlanta 3, Georgia.

Mando Adopts Radio To Speed Operations

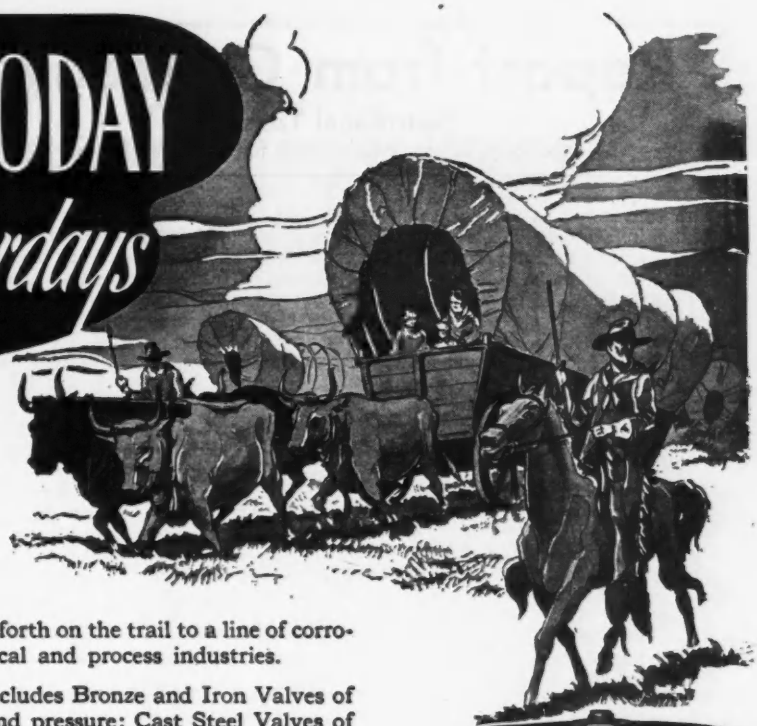
(Continued from page 7)

panel is exposed which contains a loud speaker, the necessary controls, and a wall bracket to mount and hold the telephone handset. In the upper right hand corner of the trunk is located an antenna mounting bracket.

The complete station can be assembled and put on the air in less than five minutes, according to Mando's electronics engineer.

"The use of radio in the log drive and general applications is comparable to a military expedition," Mr. Andrews said, "since the problems of logistics and remote locale are so similar and a steady stream of food and stores must be kept moving to the camps."

PIONEERS TODAY *as in the yesterdays*



More than a century ago Powell started pioneering in the field of industrial valves.

The first bronze regrinding globe valve was a *Powell "first"*.

And, twenty-five years ago, with the establishment of the Special Design and Alloy Valve Division, Powell Pioneers were the first to set forth on the trail to a line of corrosion-resistant valves for the chemical and process industries.

Today the complete Powell Line includes Bronze and Iron Valves of every required type, design, size and pressure; Cast Steel Valves of every type, in pressure classes from 150 to 2500 pounds; and, for the chemical and process industries, a complete line of Corrosion-Resistant Valves in many special designs and the widest range of pure metals and alloys ever used in making valves.

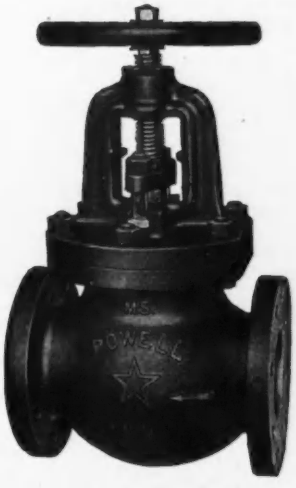


Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Made in sizes 2″ to 16″, incl. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also available in All Iron.

Fig. 190—Small 150-pound Iron Body Bronze Mounted "Irenew" Globe Valve. Has screwed ends, union bonnet and regrindable, renewable, wear-resisting "Powellium" nickel-bronze seat and disc. Also available in All Iron.

Fig. 500—Small 125-pound Bronze Gate Valve with screwed ends, inside screw rising stem, screwed-in bonnet and taper wedge disc: solid in sizes ¼″ to ⅜″; double in sizes 1″ to 3″

Fig. 1793—Large 125-pound Iron Body Bronze Mounted Gate Valve. Made in sizes 2″ to 30″, inclusive. Has outside screw rising stem, bolted flanged yoke and taper wedge solid disc. Taper wedge double discs can be provided in sizes 2″ to 12″, inclusive.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

Report from Germany

Nutritional Yeast

By Otto Goy, Editor, Wochenblatt für Papierfabrikation

The conversion of the lyes (1) of the sulphite-cellulose factories (called sulfifelge) into useful products is an old problem. Shortly before the war several sulphite-cellulose factories erected sulphide-spirit plants. These facilities were further expanded during the war since the products were used as fuel (gasoline). The chemical process entails the changing of the small amounts of fruit sugar (Hexosen) contained in these lyes to alcohol and carbonic acid through fermentation.

Besides these fermentable sugars the able sugars called wood and Pektin sugar (Pentosen) which react with certain types of Hefepilze (2). In this process the yeasts grow and increase themselves. In 1938 it was scientifically proved that Pentosen yeast could be produced from this product. After the terrific expansion of the artificial wool and silk industries in which large quantities of Beechwood (3) were used, the waste lyes contained increasing amounts of unfermentable Pentosen (sugars) but which were suitable to the production of yeast. For the conversion of these lyes the Cellose-Factory Waldhof built at their Mannheim Works in the former alcohol division a nutritional yeast plant which started operations in the end of 1940 and has since then been expanded.

For this process certain products and equipment are required so that the yeast will grow and increase itself rapidly. Sugar, oxygen and certain salts are required. The sugar comes from the sulphite lye, in Waldhof the oxygen is fed into the lye through a special spraying process. For salts small amounts of nitrogen, potash (potassium) and phosphor are added. The process takes place in large tanks 6 meters (19.68 ft. high and 8 meters (26.24 ft.) in diameter which are constantly stirred. The temperature is constantly held at 35° C. (95° F.) and any excess heat is removed through watercooled pipes.

In 3 to 5 hours the sugar in the waste lye has been consumed by the yeast. About one-half is built up to a Eiweiss and absorbs the balance of the carbonic acid. The entire process can be compared to a strongly accelerated growing of a plant; and for this reason the nutritional yeast should not be considered as a synthetic product of the chemical industry.

(1) Ablauge—literal translation "lye." From the use of the prefix "ab" and in the sense of the writing it is believed the waste or by-product liquors are referred to.

(2) Hefepilze—literal translation "yeast toadstools," believed to be a fungus yeast or similar bacterial growth. Hereafter referred to as yeast in the translation.

(3) Buchenwood—literal translation is "beech-tree." However, this family of trees is believed to be much larger in Europe and to include a great number of smaller trees heavy in foliage.

The liquor is then drawn out of the yeast vats and freed from the adhering air bubbles. Then the yeast cream is separated from the yeastless liquor in a centrifuge. The yeast cream is washed, and centrifuged twice and dried. The product is a fine or flaky powder which has a pleasing spicy taste and if stored dry can be kept many years.

Nutritional yeast can be considered a valuable addition to the nourishment since it is over one-half proteins. It cannot replace entirely the animal protein but is a high grade plant protein to be compared with that of the soybean or oat. One kilogram (2.216) of nutritional yeast contains two and one-half times as much protein as one kilogram of beef, or three and one-half times as much protein as one kilogram of flour. Every grownup needs at least from fifty to 70 grams (1.86-2.46 oz.) of protein per day, of which only a part is to be found in our present day rations, and for the most part the people have had to be satisfied with plant proteins. The nutritional yeast must therefore be considered as a very valuable part of our diet. Nutritional yeast also is rich in vitamins, especially of the E type, the lack of which causes poor growth, loss of weight, tiredness and skin diseases. Other vitamins also are contained.

First-Hand Reports

This is the second of a series of reports from the German paper industry, prepared exclusively for the PAPER TRADE JOURNAL by a man who has devoted his entire career to the field of which he writes. An internationally known figure before the war interrupted communications, Mr. Goy will contribute a series of articles to these pages. They will be direct from the sources, authentic and exclusive.

The process developed at the Waldhof plant was also set up at the Kostheim and Kelheim plants of the same company. Other companies also received license and set up yeast by-product plants in their factories. The capacity of the cellulose factories in the U. S. zone would be enough to produce 14,000 tons of nutritional yeast. In Mannheim alone 6000 tons and in each Kostheim, Kelheim and Stockstadt, 2500 to 3000 tons could be made. Due to the extreme shortage of coal and fibrewood, this capacity is being used less than one-third. Unfortunately, this situation will not improve itself as the allocation of wood has further been shortened so that the availability of this yeast to the population is limited.

Cuban Paper Market Reported in Slump

WASHINGTON—The paper market in Cuba slumped during the first quarter of 1947 from 1946 levels, with marked pessimism concerning the future. The general situation was attributed partly to inadequate supplies of certain types of paper and paperboard, an American official report stated last week.

Average monthly consumption of paper and paper products during the first quarter of 1947 fell 30 percent below the average for the first quarter of 1946. Many domestic importers and members of the industry took considerable precaution in operating their businesses and maintained minimum stocks.

Stocks of paper and products such as glassine, uncoated book paper, toilet paper, cellophane, and cardboard, were insufficient at the beginning of 1947 to meet demand, and the shortage continued throughout the quarter under review. Stocks of manifold paper were high, whereas stocks of other varieties were classed as fairly adequate.

Paper imports during the first quarter of 1947 declined about 15 percent from the corresponding quarter of 1946. Imports from the United States suffered little change from the preceding quarter.

The Cuban Government enacted legislation preventing the use of duty-free newsprint for purposes other than those for which it was imported, effective January 3, 1947.

British Columbia Plants 50 Million Seedlings

VANCOUVER, B. C.—Over 50 million seedlings have been shipped to British Columbia points by the Green Timbers Forest Nursery on the Pacific Highway. This nursery is operated by the B. C. Forest Service of the provincial government and is one of the main nurseries supplying trees in connection with the reforestation program of the provincial government. Latest shipment went to Vancouver Island where the trees will be planted on logged-off areas.

The 25-acre nursery has been in operation since 1930. The 14,000,000 seedlings growing there now in time will become giants of the province's forests.

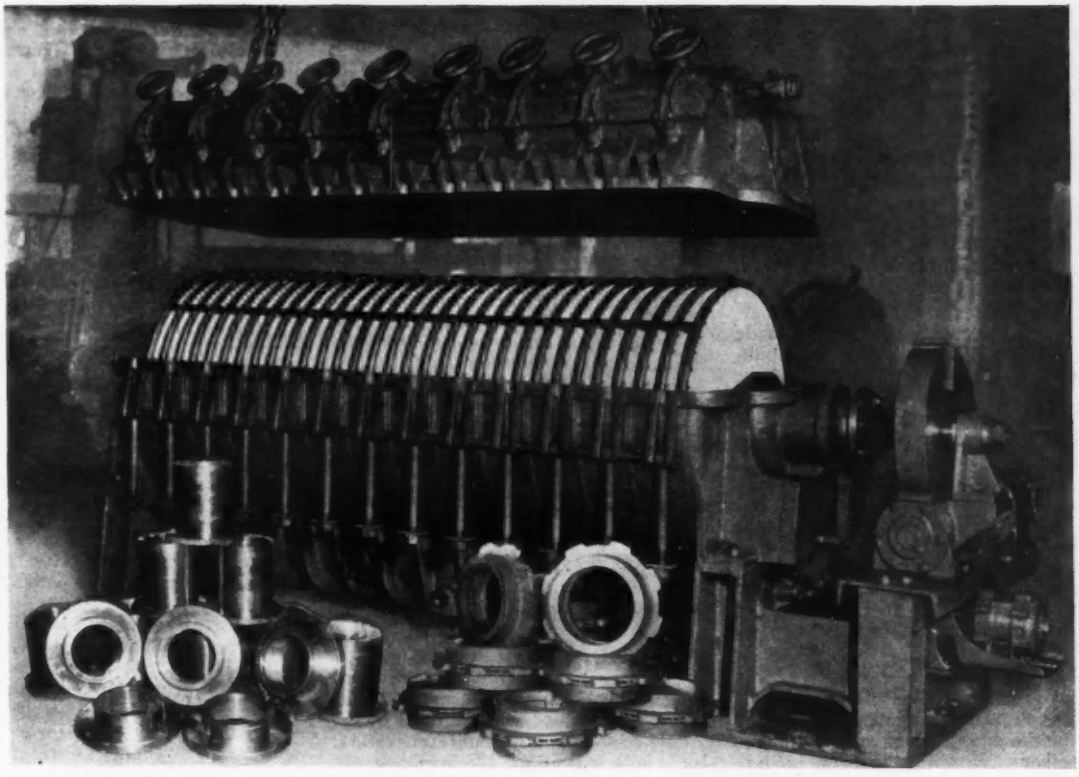
Gilbert Mill Families Picnic at Smith Park

MENASHA, Wis.—The thirteenth annual picnic for Gilbert Paper Company employes and their families was held Sunday, August 3, at Smith park. A softball game between a girls' team and a men's team from the company was one of the features. Card games of all kinds were played in the afternoon, and there was croquet for children and adults, along with numerous contests for children. A picnic supper was served, and a program was given in the evening, followed by a dance.

Centrifugally Cast

ACIPCO STAINLESS STEEL

Tubes and Parts



Vallez Rotary Filter designed and manufactured by Goslin-Birmingham Manufacturing Company. Top of filter is raised to show filtering screens. Grouped about filter are some of the Type 316 Stainless Steel Filter castings furnished by ACIPCO.

To protect their enviable reputation in the manufacture of rotary filters this company uses ACIPCO Stainless Steel castings. For the filter shown, ACIPCO furnished 18% Chrome — 12% Nickel — 2% Molybdenum stainless steel filter hubs, bushings, glands, stuffing boxes, inspection bosses, discharge spindles and centrifugally cast stainless steel shaft 11.25" OD x 9" ID x 16'-0" Long.

ACIPCO can furnish both stainless and carbon steel castings produced in stationary molds, as well as stainless and carbon steel and alloy iron centrifugally cast tubes with outside diameters from 3½" to 50" and varying wall thicknesses from ⅜" to 4". All tubes are cast in standard 16' lengths. ACIPCO is fully equipped with modern electric furnaces, complete laboratory and testing facilities, pattern and machine shops to produce and fabricate your casting requirements.

Inquiries are invited.

STEEL CASTINGS DIVISION

AMERICAN CAST IRON PIPE COMPANY

Birmingham 2, Alabama

AUSTRALIAN NOTES

PERTH, West Australia — The Commonwealth Statistician reports that total imports of oversea newsprint for the month of March, 1947, were 9,075 tons, valued at $1,070,000, as compared with the 13,262 tons of the previous month, and the 4,759 tons of March, 1946.

Imports of other papers were: Imitation art, 101 tons (Finland, 42; U.K., 27; Sweden, 27; Norway, 5); coated printing, 105 tons (U.K., 73; U.S.A., 32); glazed imitation parchment, 42 tons (U.K., 27; Sweden, 15); lithographic, 44 tons (Finland, 24; Sweden, 13; U.K., 7); offset embossed, 6 tons (Canada, 3; Norway, 2; U.K., 1); poster, 33 tons (Finland, 28; U.K., 5); and other printing papers, 234 tons (Sweden, 63; Finland, 59; Norway, 51; U.K., 40; Canada, 14; U.S.A., 6; Holland, 1).

A recent occupational survey, made on June 1st, 1945, has just been published. This shows that throughout the Commonwealth, at that date, the following persons were engaged in industries connected with paper and paper making: Pulp and paper making, 5,857 (4,667 males and 1,190 females); paper bag making, 672 (210 m. and 462 f.); cardboard box and carton making, 2,587 (1,004 m. and 1,583 f.); stationery and paper products, 1,518 (725 m. and 793 f.); cigarette paper processing, 178 (40 m. and 138 f.); and paper pattern making, 249 (45 m. and 204 f.).

The Australian Pulp and Paper Industry Technical Association, which held its first annual general meetjng a few weeks ago, then gave attention to a number of technical papers, including: "The Australian Eucalypts" (Mr. I. H. Boas), "Timber As A Crop" (Mr. R. H. Needham), "Other Fibrous Raw Materials" (Mr. J. J. Knewstubb), "Pulp and Paper In Japan" (Dr. W. E. Cohen), "An Historical Review of Pulp and Paper Making In Australia" (Mr. R. B. Jeffreys), "Preparation and Properties of Chlorine Pulp From Eucalypts" (Mr. J. L. Somerville), "Maintenance Problems In Eucalypt Sulphate Pulp Mills" (Mr. A. R. Tongue), "Corrosion" (Mr. S. C. Johnson), "The Art and Science of Paper Making" (Mr. W. G. Purdie), "Assessment of the Suitability of Eucalypt Species For Soda Pulping" (Mr. A. R. Sloman), "A Survey of Pulping Methods" (Mr. F. P. Stops), "Electrolytic Production of Chlorine and Caustic Soda" (Mr. J. J. Graham), "Vapour Absorption On Paper Machines" (Mr. G. Feinaigle), and "Instrumentation In the Pulp and Paper Industry" (Mr. G. Phillips).

The Kaolin Corporation, N. L., Adelaide, reports that negotiations are continuing with the main lessee with a view to amalgamation of interests and recapitalisation to provide for the thorough mechanisation and expansion of plant.

The Western Australian State Statistician reports that the factory production of stationery, paper, etc., last year increased by $591,397. At the moment there are 101 factories in that State engaged in the manufacture of paper, stationery, etc., and some $2,356,800 is invested in land and buildings, together with a further $1,060,800 in plant and machinery. There are 1,310 workers engaged, and total salaries and wages for the year were $1,670,400. Total output was valued at $5,601,600; net production being $3,230,400.

The Minister for Post-War Reconstruction (Mr. Dedman) has tabled in the Federal House of Representatives further lists of commodities which may be affected by the tariff negotiations at Geneva. Items in the Australian tariff on which other countries are now asking Australia to negotiate include: Suphuric, nitric, phosphoric and hydrochloric acids; flypapers; paper-working machinery; fruit wrappings; millboards; paperhangings; photographic papers and filter papers.

Pulp Consumers Open Offices in New York

NEW YORK—Offices of the Association of Pulp Consumers, Incorporated have been opened at 385 Madison Avenue. Karl A. Clauson, newly-elected secretary of the group, will direct activities of the new national office. The Association formerly maintained offices at Washington, D. C.

The Association of Pulp Consumers, Inc., is a group of 178 member organizations operating 285 mills. It represents the non-integrated paper mills who buy the major part of their pulp requirements.

Along with the opening of the New York office as national headquarters, the Association has embarked on a more intensive program looking toward the continuation of a free world market in pulp and an increased supply to American consumers. As part of this program the group will set up channels for exchange of information with pulp-producing and pulp-consuming industries both in this country and abroad, and will study the long-term trends of supply and demand with particular reference to their effect on the non-integrated paper mills.

Celanese Lets Excavation

VANCOUVER, B. C.—Contract valued at $400,000 has been placed for rock excavation and preparation of the site for the new $15,000,000 cellulose plant of the Celanese Corporation of America at Prince Rupert, B. C. The initial contract has been placed with the British Columbia Bridge and Dredging Company of Vancouver.

United Kingdom Ups Its Paper Output

WASHINGTON—United Kingdom importation of paper and paperboard rose 35 percent in the first quarter 1947, and exports 48 percent, compared with the same period of 1946, the American Embassy reported last week.

Paper production in the United Kingdom averaged 20,171 short tons weekly during February 1947, compared with 26,144 tons weekly in January, and 25,717 tons weekly during 1946. Weekly newsprint production averaged 3,868 tons in February, compared with 6,091 tons in January, and 6,236 tons in 1946. The average weekly production of paperboard was as follows: 6,601 tons in February 1947; 11,316 tons in January 1946; and 11,004 tons in 1946. Board for packaging made up the largest share of the production, amounting to a weekly average of 8,799 tons during 1946.

The weekly average production of both paper and paperboard, individually, was slightly higher in January than in any week in 1946; in February, however, the effect of the fuel crises had become apparent, bringing the average weekly production of all types of paper and paperboard to only 73 percent of the 1946 average. Data for March are not as yet available.

Pulp consumption was 18,810 tons weekly during 1946, and waste-paper consumption totaled 13,200 tons.

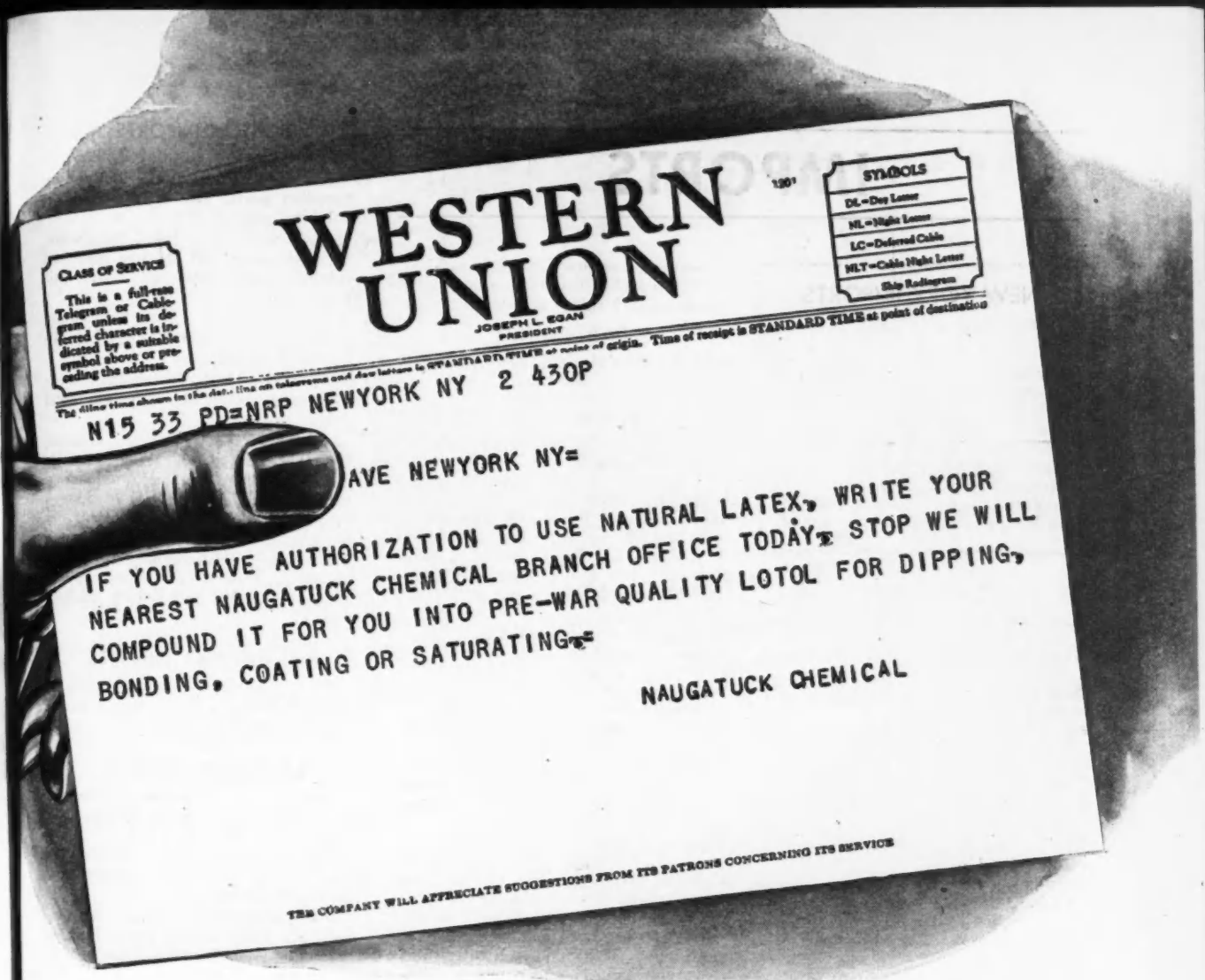
Imports of paper-making materials into the United Kingdom totaled 224,709 tons during the first quarter of 1947, compared with 191,543 tons in the corresponding quarter of 1946. Imports of esparto grass increased to 81,426 tons from only 5,931 tons in the first quarter of 1946, whereas imports of practically all types of wood pulp decreased. Sweden was the chief supplier of wood pulp during each period.

Imports of paper and paperboard showed an increase of 35 percent during the first quarter of 1947, over the corresponding quarter of 1946. Despite the general increase in these imports, newsprint imports decreased by almost 50 per cent. There were significant increases in glazed-paper imports, however, and a marked increase in imports of strawboard. The chief suppliers during the 1947 quarter were Sweden, Netherlands, Canada, Norway, and Finland, which accounted for 1,518,088 hundredweight.

Exports of paper and paperboard increased by 48 percent during the first quarter of 1947 over the corresponding period of 1946. Exports went chiefly to Eire, India, Australia, Union of South Africa, and New Zealand, which countries accounted for 281,000 hundredweight, during the first quarter of this year.

Appleton Staff Enjoys Clambake

APPLETON, Wis. — The Appleton Coated Paper Company held its annual employes picnic Sunday, July 27, at Telulah park, in this city.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BRANCHES: AKRON, BOSTON, DETROIT, LOS ANGELES, NEW YORK

IMPORTS

NEW YORK IMPORTS

WEEK ENDING AUGUST 2, 1947

SUMMARY

Newsprint	10,811 rolls
Gummed Paper	51 cs.
Wall Paper	6 cs.
Drawing Paper	3 cs.
Filter Paper	23 cs., ctns.
Paper Hangings	8 pkgs.
Printing Paper	3 cs.
Sulphite Paper	567 rolls
Cardboard	400 bls.

NEWSPRINT

R. A. Olsen, Inc., G.T.D., Donnacona, 361 rolls.

News Syndicate Co., Mimi, Thorold, 1400 rolls.

R. A. Olsen, Inc., Newscarrier, Donnacona, 376 rolls.

International Paper Co., International No. 1, Gatineau, 297 rolls.

R. A. Olsen, Inc., Kermic, Donnacona, 370 rolls.

News Syndicate Co., Ted, Thorold, 1481 rolls.

H. G. Craig Co., G.D.D., Donnacona, 357 rolls.

Montmorency Paper Co.; Empire Caicos, Botwood, 4298 rolls.

Montmorency Paper Co., (Alexandria, Va.), Empire Caicos, Botwood, 1871 rolls.

GUMMED PAPER

B. F. Drakenfeld & Co., Fort Ticonderoga, Liverpool, 51 cs. (not printed).

WALL PAPER

Meadows Wye & Co., American Merchant, London, 1 cs.

Hudson Shipping Co., American Merchant, London, 3 cs.

W. H. S. Lloyd & Co., Queen Elizabeth, Southampton, 1 pkgs. (samples).

American Express Co., Wisconsin, Havre, 2 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Mauretania, Southampton, 3 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Mauretania, Southampton, 23 cs., 4 ctns.

PAPERHANGINGS

W. H. S. Lloyd & Co., American Merchant, London, 8 pkgs.

PRINTING PAPER

Judson Sheldon Div. National Carloading Co., American Merchant, London, 3 cs.

SULPHITE PAPER

Resolute Paper Products Corp., Gripsholm, Gothenburg, 296 rolls (white).

F. P. Gaskell & Co., Gripsholm, Gothenburg, 271 rolls (unbleached).

CARDBOARD

Absorbo Beer Pad Co., Inc., Alma Victory, Trieste, 400 bls.

RAGS, BAGGINGS, ETC.

A. W. Fenton Co., Exiria, Naples, 162 bls. dark cottons.

J. Eisenberg & Son, Phoebe Knot, Havana, 46 bls. rags.

W. Steck & Co., Exchester, Alexandria, 79 bls. old hessian rags.

E. J. Keller Co., Inc., Exchester, Alexandria, 119 bls. old hessian rags; 50 bls. new hessian rags; 84 bls. old bagging.

Midwest Waste Material Co., Exchester, Alexandria, 200 bls. hessian tares.

W. H. Green & Co., Steel Artisan, Bombay, 100 bls. old jute rags.

Brandwein Mazur Co., Steel Artisan, Bombay, 300 bls. cotton waste.

Buffalo Batt & Felt Corp., Steel Artisan, Bombay, 250 bls. cotton waste.

E. J. Keller Co., Inc., Steel Artisan, Bombay, 250 bls. old jute rags.

OLD ROPE

National City Bank, Gudrun Maersk, Rotterdam, 84 coils old manila rope.

W. Steck & Co., Gripsholm, Gothenburg, 56 bls. used manila cordage.

C. Smiles, Mahronda, Calcutta, 355 bls. old hemp rope cuttings.

CASEIN

American British Chemical Supplies, Mormacrio, Buenos Aires, 1000 bags, 50,000 kilos.

HIDECUTTINGS

Karr Ellis & Co., Fort Ticonderoga, Liverpool, 398 bags.

John Gorvers Co., Karla Dan, Buenaventura, 114 bdls.

H. Remis, Santa Monica, Barranquilla, 46 bdls.

John Gorvers Co., Santa Monica, Barranquilla, 999 bdls.

PORTLAND IMPORTS

WEEK ENDING AUGUST 2, 1947

Gottesman & Co., Inc., Tunaholm, Sweden ports, 1800 bls. unbleached sulphite pulp.

J. Andersen & Co., Tunaholm, Swedish ports, 1470 bls. kraft sulphate pulp.

Pagel Horton & Co., Inc., Tunaholm, Swedish ports, 2134 bls. dry bleached sulphate pulp.

Cellulose Sales Co., Inc., Tunaholm, Swedish ports, 300 bls. kraft sulphate pulp; 300 bls. kraft sulphite pulp.

Bulkley Dunton Pulp Co., Tunaholm, Swedish ports, 912 bls. unbleached sulphite pulp.

BOSTON IMPORTS

WEEK ENDING AUGUST 2, 1947

Gottesman & Co., Inc., Tunaholm, Swedish ports, 900 bls. unbleached sulphite pulp.

Cellulose Sales Co., Inc., Tunaholm, Swedish ports, 510 bls. dry bleached sulphite pulp; 4590 bls. kraft sulphate pulp.

Pagel Horton & Co., Inc., Tunaholm, Swedish ports, 7164 bls. dry bleached sulphate pulp.

Price & Pierce, Ltd., Tunaholm, Swedish ports, 6000 bls. dry chemical pulp.

(———), Richard M. Pearson, Rauma, 1960 bls. string unbleached sulphite pulp; 1000 bls. prime unbleached sulphate pulp.

Pulp Sales Corp., Richard M. Pearson, Jacobstad, 6 bls. easy bleaching pulp; 6 bls. strong bleachable pulp; 4028 bls. prime unbleached sulphite pulp; 4396 bls. strong unbleached sulphite pulp.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 2, 1947

Drueding Bros. Co., Exchester, Genoa, 7 cs. tissue paper caps.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 2, 1947

Pulp Sales Corp., Richard M. Pearson, Jacobstad, 9836 bls. extra strong prime unbleached sulphite pulp; 1445 bls. strong bleachable prime unbleached sulphite pulp.

(———), Richard M. Pearson, Rauma, 3471 bls. extra strong prime bleachable sulphite pulp; 12,513 bls. strong bleachable sulphite pulp.

Stough Promotes Eskildsen To Senior Rank

CHICAGO — Alfred Eskildsen, associated with Robert A. Stough Company, Inc., as a junior salesman, has just been appointed senior salesman to handle some of the more important accounts in the city of Chicago.

Mr. Eskildsen was formerly with the Marine Corps, saw action on Saipan and Iwo Jima, and was wounded while in action. After recuperating in a government hospital in Hawaii he was released from the service about a year ago. Until coming with the company in January, he held a responsible position in another field.

James O'Rourke has been appointed junior salesman to cover some of the trade in Chicago and outlying territory in Illinois.

Office Manager

Miss Mary Frances O'Connor has recently been appointed office manager of the newly opened South side branch and warehouse of the Jonassen Paper Compay, which is rapidly expanding its facilities to customers in the Chicago area.

"In my business, we could use more caustic soda, soda ash and sodium bicarbonate than we're getting . . . and that goes for liquid chlorine, too. But at least we know where we stand. Mathieson took the trouble to explain the whole story to us—why there's a shortage of these important heavy chemicals . . . what to expect in the way of increased supplies in 1947 and 1948. Mathieson always works with us . . .

. . . and that's why we like to do business with Mathieson!"*

The foregoing is based on reactions to our advertisement—"Why you can't buy all the Caustic Soda, Soda Ash, Sodium Bicarbonate and Chlorine you want"—which appeared in many publications earlier this year.

The Mathieson Alkali Works (Inc.), 60 East 42nd Street, New York 17, N. Y.

Mathieson

CHEMICALS

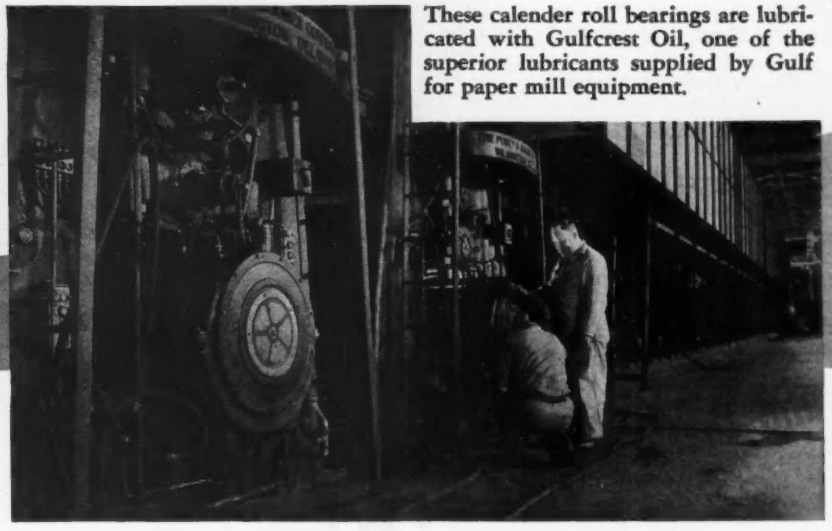
Caustic Soda . . . Soda Ash . . . Sodium Bicarbonate . . . Liquid Chlorine . . . Chlorine Dioxide . . . Ammonia, Anhydrous & Aqua . . . HTH Products . . . Fused Alkali Products . . . Dry Ice . . . Carbonic Gas Sodium Chlorite Products . . . Sodium Methylate

GULFCREST OIL

can help you get:

improved uniformity

greater tonnage



These calender roll bearings are lubricated with Gulfcrest Oil, one of the superior lubricants supplied by Gulf for paper mill equipment.

IN YOUR CONTINUING EFFORTS to improve quality, increase output, and reduce maintenance costs, it may pay you to check up on your lubrication practice. Is it as up-to-date as other vital production factors in your mill?

Call in a Gulf Lubrication Engineer and make sure! He will recommend the proper lubricants for every unit—help you install the kind of lubrication practice that means less wear and smoother operation of paper machinery. Result: You'll get improved uniformity and greater tonnage in your mill—at lower cost for maintenance.

The co-operative counsel of a Gulf Lubrication Engineer—and the Gulf line of more than 400 quality lubricants—is available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.

Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

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GULF INDUSTRIAL LUBRICATION

• PAPER—WOODPULP •

EXPORT **IMPORT**

OFFICES: GOTHENBURG · LONDON · SAO PAULO · BUENOS AIRES · RIO DE JANEIRO · SHANGHAI

ELOF HANSSON INC.

NEW YORK, U. S. A.

220 EAST 42ND STREET NEW YORK 17, N. Y.

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 6, 1947.

Over-all demand for paper, board and pulp remains heavy with only minor instances of easing. Some slack is noted in the demand for folding cartons, mainly due to conservative food industries ever watchful of inventories. This letdown is a spotty and temporary condition with indications pointing to increased activity within four weeks time. Indeed, some segments of the folding carton field report a very brisk business and a growing trend in prepackaging. . . . Consumption of paper, board and pulp is still greater than the productive capacity of domestic mills. Much of the record breaking production has and still is taking place in the integrated paper mills. These mills are not selling as much pulp to the market as formerly but are converting it into paper themselves. Thus, while the industry as a whole is producing increasing amounts of paper, board and pulp; some individual mills are still unable to keep running at capacity due to lack of raw materials. . . . Over-expansion is not threatening the paper industry. Trade reports indicate mill expenditures for plants and equipment reveal future cost reductions rather than expansion in plant capacity. Moreover, if and when consumption falls off, many obsolete and marginal mills can be taken out of operation without involving large writeoffs. Meanwhile, paper usage continues to grow, with some sources predicting an 85 per cent increase in consumption from 1940 to 1960.

OPPORTUNITY FOR TECHNICAL MAN

There is in this industry a technical man who can be of greater service to the entire industry. If you have the ability to evaluate technical articles before publication and a desire to spend some time visiting the paper mills, the Paper Trade Journal can use your services. The position as Technical Editor will be a permanent one. All replies will be treated in confidence if addressed to

George E. Lockwood
PAPER TRADE JOURNAL
15 W. 47th Street
New York 19, N. Y.

A-14

The index of general business activity for the week ended July 26 rose to 144.4 from 142.8 in the preceding week, compared with 138.1 for the corresponding week in 1946. The index of paperboard production rose to 174.2 from 170.7 in the preceding week, compared with 159.0 for the corresponding week in 1946.

Paper production for the week ended July 26 was estimated at 105.4 percent, compared with 102.8 for the preceding week, with 104.7 for the corresponding week in 1946, with 93.4 for 1945, with 91.3 for 1944, and with 90.8 percent for the corresponding week in 1943.

Paperboard production for the week ended July 26 was 99.0 percent of capacity, compared with 97.0 percent for the preceding week, with 95.0 for the corresponding week in 1946, with 95.0 for 1945, with 96.0 for 1944, and with 97.0 percent for the corresponding week in 1943.

There were 4,474 forest fires on National Forests or on adjacent land during the first six months of this year according to the Forest Service of the U. S. Department of Agriculture. The flames burned over almost 95,000 acres and preliminary estimates put the cost of suppression in the neighborhood of $2,000,000. All were man caused except 519 which were set by lightning. . . . Forest Service smokejumpers, airplane patrols and ground forces held the acreage burned up to June 30 this year to the lowest figure in any first half year on the National Forests since before the war. The average area burned in the first six months of the years 1942-46 was 157,408 acres, and 135,197 acres were burned the first half of last year, but only 94,733 were swept by the flames up to June 30 this year. . . . More than half of this year's fires up to June 30 in the National Forests occurred in the eleven Southern States. Of the 2,549 fires in this region, 2,512 were man caused. The comparatively large number of forest fires in the south is due to the fact that the region's worst fire season comes in the spring while in the western states the big fire hazard is still ahead. . . . Michigan, Wisconsin and Minnesota, with 768 fires, had the next largest number of 1947, first-half fires. They burned over 11,775 acres. . . . Other regions reporting National Forest fires running into three figures were: Arizona and New Mexico, 450 fires; Oregon and Washington, 143 fires; California, 282 fires; and the northeastern states, 135 fires. Twenty fires which burned over 38 acres, 19 man caused, were reported from the National Forests of Alaska.

A measure designed to establish a newsprint industry in Alaska has been approved by the Senate. The bill authorizes the Forest Service of the Agriculture Department to sell timber in the Tongass National Forest of southeast Alaska to paper companies. According to the Forest Service, the measure permits the establishment of five $30,000,000 paper mills in the territory. . . . Senator Homer Capehart of Indiana is said to be studying the possibility of requiring that part of any newsprint produced in Alaska be alloted to small publishers. He is chairman of a committee that plans an on-the-spot study of the proposed establishment of the five paper mills. Two companies are understood to be ready to bid for the timber and to start immediate construction of mills. Estimates indicate that each of the proposed five mills would be able to produce 200,000 tons of newsprint annually for a total of 1,000,000 tons. This would be about one-quarter of present consumption in the United States.

Wood Pulp

The Customs Bureau reports two rulings on the tariff classification of types of wood pulp for duty purposes. It has decided that unbleached wood pulp, bearing slight perforations along a center line at intervals of about 2½ inches, is dutiable as paperboard at 10 per cent, or as paper not specially provided for at 30 per cent, depending upon its thickness. Such material is not removed from either classification by the perforations and is not entitled to free entry as wood pulp, the bureau holds. Sheets of plaster surfaced on both sides with thin pieces of wood pulp which adheres to the plaster for use as a wallboard is held to be a manufacture of which plaster is the component of chief value, with duty at 35 per cent. Both rulings will apply to shipments entered or withdrawn from bond for consumption on or after August 4.

Rags

Paper mills are actively buying good grades of rags. With the market as strong as it is, prices show an upward tendency. New domestic white cotton shirt cuttings continue strong at the $11.50 to $12.00 per 100 pound level plus dealer's commission. White back blue overalls are up to $8.50 from $8.25. Unbleached fancy shirt cuttings

(Continued on page 38)

CHEMICAL USERS' GUIDE To General Chemical Company Products for the Paper Industry

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTH (MIN.)	SHIPPING CONTAINERS	APPLICATIONS
Aluminum Sulfate $Al_2(SO_4)_3 \cdot 14H_2O$ approx. *(Alum)*	Commercial & Iron Free; Lump, Ground Powdered	17.25% Al_2O_3	Bags Bulk Carloads	Precipitation of rosin size and filler; water clarification; manufacture of satin white; pitch control; mordant for dyes.
Aluminum Sulfate $Al_2(SO_4)_3$ + water *(Liquid Alum)*	Liquid	32° Be (total Al_2O_3 * 7.2%)	Tank Trucks Tank Cars	Same as commercial dry product but lower strength.
Salt Cake Na_2SO_4 *(Sodium Sulfate)*	White or Grayish Granules	95-99% Na_2SO_4	Bags Bulk Carloads	Used in kraft cooking liquors as the source of Na_2S.
Glauber's Salt, Crystal $Na_2SO_4 \cdot 10H_2O$ *(Sodium Sulfate)*	Colorless Crystals	96% $Na_2SO_4 \cdot 10H_2O$ (42.3% Na_2SO_4)	Bags Barrels	Substitute for salt cake in kraft cooking liquor.
Glauber's Salt, Anhydrous Na_2SO_4 *(Sodium Sulfate)*	White Granules	99.5% Na_2SO_4	Bags Bulk Carloads	Same as Crystal but stronger product.
Sulfuric Acid H_2SO_4	Liquid	66° (93.19%), 99% 20% oleum and higher strengths	Carboys Steel Drums Tank Trucks Tank Cars	Wire scouring; parchmentizing; acid wash in last stage of multi-stage pulp bleaching; neutralizing tall oil soaps.
Sodium Thiosulfate $Na_2S_2O_3 \cdot 5H_2O$ *(Hypo)*	Colorless Crystals	99.75% $Na_2S_2O_3 \cdot 5H_2O$	Bags Fibre Drums	Anti-chlor.
Sodium Sulfite, Anhydrous Na_2SO_3 *("Sulfite")*	White Powder	98.5% Na_2SO_3	Bags Fibre Drums	Anti-chlor.
Sodium Silicate $Na_2O \cdot XSiO_2$ + water *(Water Glass)*	Liquid	38°, 41°, 42° Be; special and higher strengths	Steel Drums Tank Cars Tank Trucks	Adhesive for corrugated and solid fibre board; used in coating mixtures to reduce viscosity and in beater sizing to stiffen paper.
Chromium Potassium Sulfate $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ *(Potash Chrome Alum)*	Red Violet Crystals	99.5% $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$	Fibre Drums	Used in "save-all" or white water systems.
Aqua Ammonia NH_4OH + water *(Ammonia)*	Colorless Liquid	26° Be (29.4% NH_3)	Carboys Steel Drums Tank Trucks	Used with chlorine to form chloramines for slime control.
Sodium Fluoride	Powder	90% NaF 95% NaF	Barrels Fibre Drums	Preservative and stabilizer for starch in coating mixtures.
Tetrasodium Pyrophosphate, Anhydrous $Na_4P_2O_7$ *(TSPP) (Pyro)*	White Powder	98% $Na_4P_2O_7$ (Equiv. 52% P_2O_5)	Bags	Felt washing; pitch dispersion.
Nitric Acid HNO_3 + water	Liquid	42° Be 67.2% HNO_3	Carboys Drums Tank Trucks	Nitrating pulp; cleaning monel metal.
Sodium Sulfide Na_2S + water	Red Chips or Solid Mass	60% Na_2S	Steel Drums	Substitute for salt cake in modified soda process.

BASIC CHEMICALS

GENERAL CHEMICAL COMPANY

FOR AMERICAN INDUSTRY

OTHER PRODUCTS: Hydrochloric Acid; Sodium Metasilicate; Trisodium Phosphate; Copper Sulfate; Disodium Phosphate.
FOR THE LABORATORY OR SPECIAL APPLICATIONS: BAKER & ADAMSON REAGENTS and FINE CHEMICALS.

GENERAL CHEMICAL COMPANY

40 RECTOR STREET • NEW YORK 6, N. Y.

Sales and Technical Service Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport Buffalo • Charlotte • Chicago • Cleveland • Denver • Detroit • Houston • Kansas City Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Providence • San Francisco Seattle • St. Louis • Wenatchee & Yakima (Wash.)

In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—
Roll, contract ....$87.50 to $90.00
Sheets .....$109.00 " —

Kraft—per cwt.—Carload Quantities

Zone A, Delivered
40 lb. base weight

Superstandard Wrapping	$7.00	to	—
No. 1 Wrapping	6.50	"	6.75
Standard Wrapping	6.00	"	6.25
Standard Bag	5.75	"	6.25

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	$1.65	to	$1.72
Wh. No. 1 M. G.	1.65	"	1.72
Wh. No. 1½	1.48	"	—
Wh. No. 2	1.55	"	—
Kraft Anti-Tar	13.85	"	—
Kraft Unbl.	1.85	"	—
Manila No. 2	1.62	"	—

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached	$5.50	to	$6.40
Bleached	6.50	"	7.60

Paper Towels—Per Case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9½			$4.85
Br. Sr. M'tif'd 10x12			3.45
Br. Jr. M'tif'd 9½x9¾			2.95
Br. Jr. Sgl. fold 10x10¾			3.10

Manila—per cwt.—C. l. f. a.

No. 1 Jute Tag			$13.80
Reg. Jute Manila			13.25
No. 1 Manila			9.75

Boards, per ton—

News	$92.50	"	—
Chip	90.00	"	—
Sgl. Mia. L1 Chip*	102.50	"	—
White Pat. Coated*	120.00	"	—
Kraft Liners 42 lb.	95.00	"	—
Binders Boards	126.00	"	—

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1: Rag Content Bonds and Ledgers—

White, Assorted Items
Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$55.00	$50.00	$48.00
100% Rag	46.50	43.00	41.25
75% Rag	35.00	32.50	31.50
50% Rag	31.50	28.75	27.50
25% Rag	28.00	25.50	24.50

Ledgers, per cwt.

100% Rag Ext. No. 1	$54.25	$50.00	$48.00
100% Rag	46.25	42.50	40.75
75% Rag	36.00	33.25	31.75
50% Rag	31.00	28.00	27.00
25% Rag	27.25	24.75	23.75

Sulphite Bonds and Ledgers—White, Assorted Items
Bonds, per cwt.

No. 1	$18.75	$16.25	$15.50
No. 2	17.00	15.25	14.50
No. 4	16.00	14.50	14.00

Ledgers, per cwt.

No. 1	$17.00	$17.00	$16.35
No. 2	17.75	16.25	15.50
No. 4	17.00	15.00	14.25

Free Sheet Book Papers—White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated	$19.40	$18.60
No. 2 Glossy Coated	18.15	17.35
No. 3 Glossy Coated	17.65	17.00
No. 1 Antique (Water marked)	$14.90	$14.25
No. 2 Offset	15.35	14.70
A Grade E. F.	13.90	13.30
A Grade S. & S. C.	14.40	13.70
B Grade E. F.	Nominal	
B Grade S. C.	Nominal	
C Grade E. F.	Nominal	
C Grade S. C.	Nominal	
D Grade E. F.	Nominal	
D Grade S. & S. C.	Nominal	

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT
Groundwood	$75.00 to $80.00
Unbleached Sulphite	115.00 " 117.00
Bleached Sulphite	121.00 " 125.00
Bleached Soda	115.00 " 120.00
Unbleached Kraft	112.50 " 120.00
Southern Kraft	90.00 " 102.50

Canadian mill Prices delivered with freight allowances unless otherwise specified:

	Per Short ADT
Select Unbleached Kraft (no freight allowance)	115.00 " —
Unbleached Sulphite	115.00 " 117.00
Glassine Unbleached Sulphite (no freight allowance)	112.00 " —
Bleached Soda	105.00 " 115.00
Groundwood	75.00 " 80.00
Sideruns Pulping News	75.00 " 80.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Kraft	$150.00 to 156.00
Bleached Sulphite	151.00 " 158.50
Unbleached Sulphite	121.00 " 131.00
Unbleached Kraft	116.00 " 126.00

Finnish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50 to $12.00
Light Silesias	7.50
Unbleached Muslin	11.50 " 12.00
White Back Blue Overalls	8.50
Blue Overalls	7.75
Unbl. Fancy Shirt	5.00 " 5.50
Light Percales	6.00 " 6.50
Light Prints	5.25 " 5.95
Washables	4.00
Bleachable Khaki	6.00 " 6.50
Unbleachable Khaki	5.50 " 6.00
Cottonades	5.00 " 5.50

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$4.50
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	1.35
No. 2 Roofing Rags	1.25
No. 3 Jute Bagging	1.15
No. 4 Brussels and hard back carpets	1.15
No. 5A Roofing Rags	1.15

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings	$6.00 to —
New Mixed Cuttings	6.50 " —
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings	13.00 " 15.00
Fancy Shirt Cuttings	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens	$14.00 to 16.00
No. 2 White Linens	12.00 " 13.00
No. 3 White Linens	8.00 " 9.00
No. 4 White Linens	8.00 " 9.00
No. 1 White Cottons	10.00 " 12.00
No. 2 White Cottons	8.00 " 9.00
No. 3 White Cottons	6.50 " 7.00
No. 4 White Cottons	5.00 " 5.50
Extra Light Prints	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints	5.25 " 5.75
Dutch Blue Cottons	5.25 " 5.50
Checks and Blues	4.00 " 4.25
Linsey Garments	3.00 " 3.75
Dark Cottons	2.50 " 3.00
Old Shopperies	2.50 " 3.00
New Shopperies	2.50 " 3.00

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares	4.50 " 4.75
Heavy Wool Tares	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope	6.00 " 7.00
Domestic Manila Rope	5.75 " 6.50
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings	5.50 " 6.00
Mixed Strings	1.75 " 2.50

Waste Paper

Prices to Mills
(Dollars Per Ton)
F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$120.00 to $130.00
No. 1 Hard White Envelope Cuts	100.00 " 110.00
No. 1 Hard White Shavings, unruled	100.00 " 110.00
No. 1 Hard White Shavings, ruled	90.00 " 100.00
Soft White Shavings, one cut	100.00 " 110.00
No. 1 Soft White Shavings	85.00 " 95.00
Soft White Shavings, Misc.	65.00 " 75.00
No. 1 Fly Leaf Shavings	55.00 " 60.00
No. 2 Fly Leaf Shavings	50.00 " 55.00
No. 1 Groundwood Fly Leaf Shavings	30.00 " 33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)
Mixed Colored Shavings	(nominal)
Mixed Groundwood Colored Shavings	(nominal)
Overissue Magazines	(nominal)
No. 1 Heavy Books & Magazines	25.00 " 30.00
Mixed Books	15.00 " 20.00
No. 1 White Ledger	65.00 " 75.00
New Manila Envelope Cuttings, one cut	100.00 " 110.00
New Manila Envelope Cuttings	65.00 " 75.00
Extra Manilas	35.00 " 40.00
Mixed Kraft, Env. & Bag Cuttings	75.00 " 85.00
Kraft Envelope Cuttings	100.00 " 105.00
Triple Sorted, No. 1 Brown Soft Kraft	65.00 " 75.00
New 100% Kraft Corrugated Cuttings	75.00 " 85.00
No. 1 Assorted Old Kraft	40.00 " 50.00
New Jute Corrugated Cuttings	27.00 " —
Old 100% Kraft Corrugated Containers	(nominal)
No. 1 News	16.00 " 18.00
No. 1 Mixed Paper	15.00 " 17.00
Box Board Cuttings	16.00 " —
White Blank News	75.00 " 80.00
Overissue News	(nominal)
Old Corrugated	28.00 " 30.00
Mill Wrappers	22.00 " 25.00

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—India	.26	@	.29
Fine Polished—Fine India	.31	"	.33
Unpolished—Paper Makers	.28	"	.36
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings— New White No. 1	.10½	@	.11
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades— Washable Shredding	.03½	"	.04
Fancy Percales	.06¾	"	.07¼
New Black Soft	nominal		
Khaki Cuttings— Unbleachable Cotton Cuttings	.05¼	"	.06
Bleachable Cotton Cuttings	.06½	"	.07
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	@	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues— Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock— Foreign No. 1	nominal		
Domestic No. 1	2.00	"	2.05
Domestic No. 2	1.90	"	1.95
Roofing Bagging	1.90	"	1.95
Old Manila Rope	5.75	"	6.00

Bagging

(F.O.B. Eastern Shipping Point)

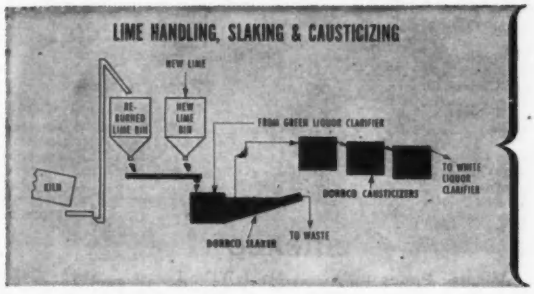
Gunny No. 1— Foreign	nominal		
Domestic	4.25	@	4.50
No. 1 Clean Bright— Sisal Strings	.04	"	.04½
No. 2 Clean Bright— Sisal Strings	.03	"	.03¼
Sisal Jute	.02¾	"	.03
Scrap— No. 1	3.25	"	3.50
No. 2	1.75	"	1.85

Here's WHY the

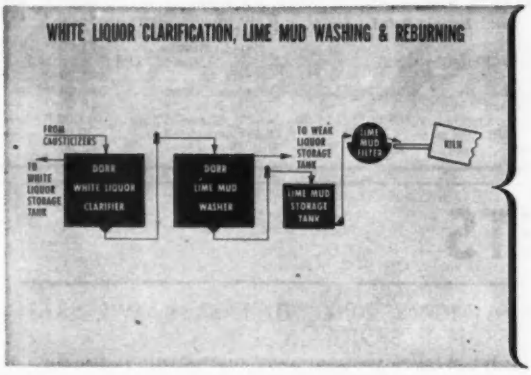
DORR CONTINUOUS RECAUSTICIZING SYSTEM

pays off in RESULTS

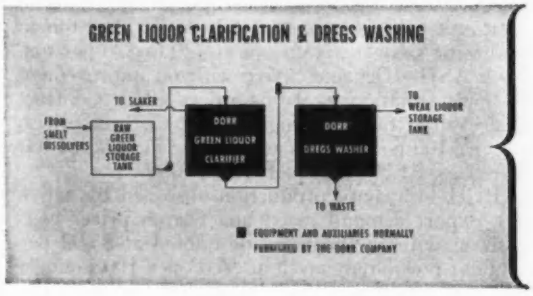
Sound equipment design coupled with improved methods of recausticizing is the reason why *the Dorr Continuous Recausticizing System provides trouble-free operation at top efficiency . . . with minimum operating costs.*



A grit-free milk of lime at correct dilution for causticizing is produced by the DORRCO SLAKER . . . a compact two-in-one unit of stainless steel construction with low first and operating costs. Adequate detention time to complete the causticizing reaction is provided by the DORRCO CAUSTICIZERS . . . of stainless steel construction requiring practically no maintenance.


WHITE LIQUOR CLARIFICATION, LIME MUD WASHING & REBURNING
FROM CAUSTICIZERS
TO WHITE LIQUOR STORAGE TANK
DORR WHITE LIQUOR CLARIFIER
DORR LIME MUD WASHER
LIME MUD STORAGE TANK
TO WEAK LIQUOR STORAGE TANK
LIME MUD FILTER
KILN

Uniformly strong and clear white liquor is produced by the DORR WHITE LIQUOR CLARIFIER . . . making it easier to control and operate the digester and resulting in more uniform pulp production. The lime mud is given *two* stages of decantation washing by the DORR LIME MUD WASHER . . . thus improving kiln and filter operation and increasing soda recovery. The lime and storage tank provides uniform feed to the Oliver Vacuum Filter which produces a well dewatered cake for burning.


GREEN LIQUOR CLARIFICATION & DREGS WASHING
TO SLAKER
FROM SMELT DISSOLVERS
RAW GREEN LIQUOR STORAGE TANK
DORR GREEN LIQUOR CLARIFIER
DORR DREGS WASHER
TO WEAK LIQUOR STORAGE TANK
TO WASTE
EQUIPMENT AND AUXILIARIES NORMALLY FURNISHED BY THE DORR COMPANY

A clean green liquor, essentially free of inorganics, is produced by the DORR GREEN LIQUOR CLARIFIER . . . permitting the lime mud to be reburned without an accumulation of impurities. Green liquor dregs are given *four* stages of washing in the DORR DREGS WASHER before discarding . . . thereby reducing the soda lost in the dregs to an absolute minimum.

A Dorr recausticizing specialist will gladly explain in further detail exactly how these methods pay off on overall pulp mill production.

DORRCO

THE DORR COMPANY, ENGINEERS
570 LEXINGTON AVE., NEW YORK 22, N. Y.
ATLANTA • TORONTO • CHICAGO
DENVER • LOS ANGELES
RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.
SUGAR PROCESSING
PETREE & DORR DIVISION, NEW YORK 22, N. Y.
ASSOCIATES AND REPRESENTATIVES
Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

RESEARCH ENGINEERING EQUIPMENT

DORR

Wool Tares, heavy	4.00	"	4.25
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$115.00
No. 1 Hard White Shavings, unruled	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	60.00	"	65.00
Soft White Shavings	80.00	"	—
No. 1 White Ledger	75.00	"	80.00
Ledger, colored	60.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	45.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper	20.00	"	—
Box Board Cuttings	20.00	"	—
Kraft Corrugated Cuttings	nominal		
Old Corrugated	30.00	"	35.00
Overissue News	40.00	"	—
No. 1 News	—	"	30.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	@	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Misc.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	@	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.50	"	—
Domestic	4.50	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.08	@	—
Fancy Percales	.07½	"	.08
New White No. 1	.11	"	.11½
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.08	"	.08½
New Black Silesias	.05	"	—
Red Cotton Cuttings	.05	"	—
Blue Overalls	.08½	"	.09
Soft Unbleached	.11	"	.12
Blue Cheviots	.08½	"	.09
Fancy	.06	"	—
Washable	.06	"	—
Khaki Cuttings	.06½	"	.07¼
Corduroy	.03½	"	—
Khaki Canvas	.06¼	"	.06½
B. V. D. Cuttings	.10½	"	.11¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues,			
Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	@	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	28.00	"	—
No. 1 News	18.00	"	—
No. 1 Mixed Paper	12.00	"	—
Old Corrugated	30.00	"	—
Mill Wrappers	22.00	"	—

MARKETS

BLANC FIXE—Market steady supplies adequate, deliveries fair. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; and $60 less car lot same basis.

BLEACHING POWDER—Supplies short although paper mill demand has eased up. Shipments improved. Quotations are unchanged. Prices on bleaching powder range from $3.00 to $3.75 per 100 pounds.

CASEIN—Current prices on processed acid precipitated casein are quoted around 24 to 26 cents per pound for domestic grades and 28 to 32 cents for imported grades f.o.b. shipping point.

CAUSTIC SODA—Market continues tight with some improvement in shipments. Solid caustic soda is reported at $2.50 to $2.75 per 100 pounds; flaked and ground offered at $2.90 to $3 per 100 pounds, car lots, at works.

CHINA CLAY—Demand continues heavy, supply tight. Domestic filler clay is currently $9 to $11 per ton, car lots. Coating clay is currently $15 to $30 car lots. Imported clay is currently quoted at from $18 to $35 per ton, in car lots, export warehouse.

CHLORINE—Strong demand continues in a tight market. Lack of tank cars continues to hamper deliveries. Quantities unchanged. Chlorine is currently quoted at $2 to $3.50 per 100 pounds.

ROSIN—Gum Rosin in drums per 100 pounds, net, in yard New York, car lots, B, D, E, $8.85; F, G, H, I, K, M, $9.01; N, $9.05; WG, $9.06; WW, $9.25. Wood Rosin per 100 pounds, l.c.l., f.o.b. N. Y., B, $6.95; FF, $8.20, G, H, I, $8.35; WG, $8.65; WW, $8.81; X, $8.91.

SALT CAKE—Demand continues strong with slight improvement in shipments. Prices remain unchanged. Domestic salt cake is quoted at $20 to $26 per ton in bulk. Chrome salt cake is quoted at $20 to $26 per ton.

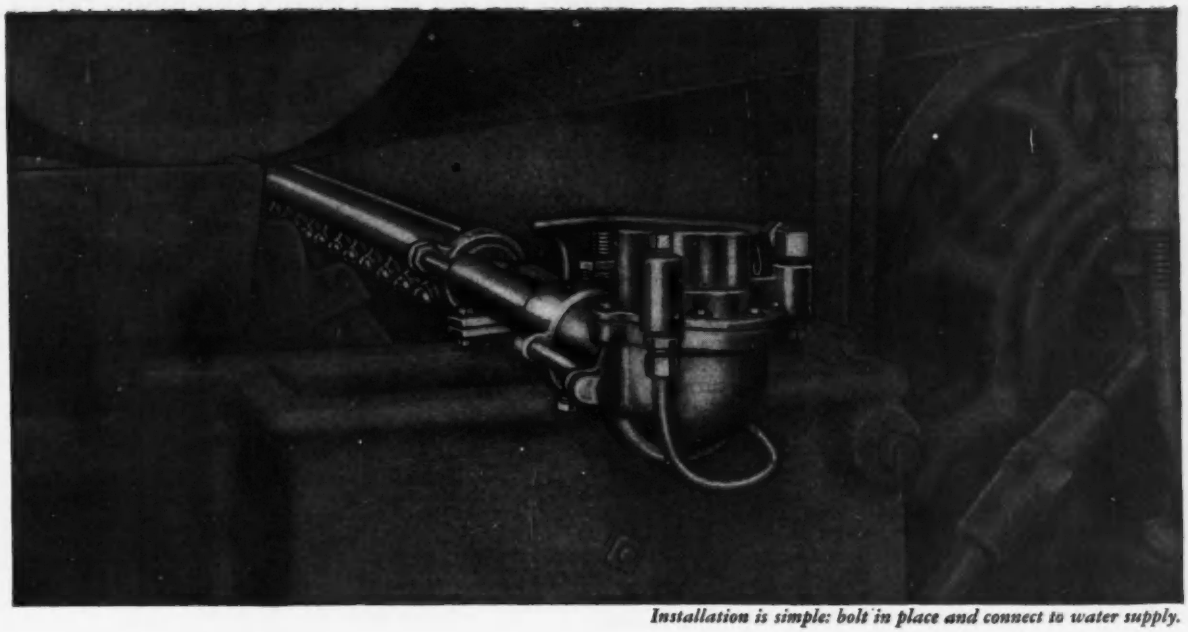
SODA ASH—Demand active with no improvement in the supply situation, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.08; in paper bags, $1.20; and in barrels, $1.60.

STARCH—Capacity production absorbed by active demand, export demand eased up. Starch prices continue strong with the pearl grade quoted at $5.92 per 100 pounds; powdered starch at $6.03 per 100 pounds, car lots, Chicago.

SULPHATE OF ALUMINA—Active demand covered by fair supplies. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is quoted at $1.95 to $2.25 per 100 pounds, in bags at works.

SULPHUR—Plentiful supplies to meet active domestic and export demands. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $19.50 per long ton.

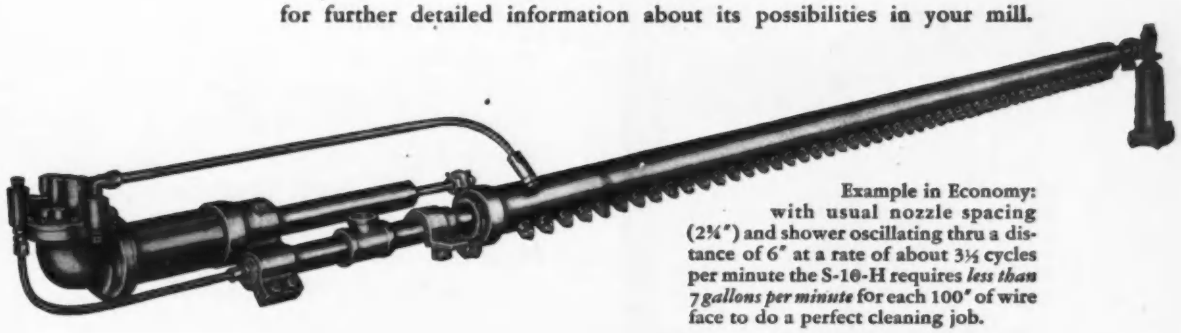
TALC—Domestic and French markets have eased up, prices remain steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines: Canadian at $35 to $45 per ton. All prices in car lots.



Installation is simple: bolt in place and connect to water supply.

THE *Broughton* S-10-H HYDRAULICALLY OSCILLATED SHOWER

This completely hydraulic shower is quickly adaptable to cylinder moulds, thickeners, save-alls, wires or felts. Designed for efficient and dependable operation, it does a perfect job of cleaning while at the same time reducing stock adulteration and saving tremendous quantities of water. In many leading mill installations throughout this country and abroad, water expenditures for cleaning have plummeted to offset the shower cost in an incredibly short time. We invite your inquiry for further detailed information about its possibilities in your mill.



Example in Economy: with usual nozzle spacing (2¼") and shower oscillating thru a distance of 6" at a rate of about 3½ cycles per minute the S-10-H requires *less than 7 gallons per minute* for each 100" of wire face to do a perfect cleaning job.

A. E. BROUGHTON & COMPANY

Glens Falls, New York

Trends

(Continued from page 32)

are up to $5.50 from the $4.50 to $5.00 level. Light percales are closer to $6.50 from the recent $5.50 to $6.00 mark. Bleachable khaki now brings $6.50; and unbleachable khaki $6.00 and cottonades $5.50.

Demand for old domestic cotton rags is showing some improvement. No. 1 whites repacked are taken up at $4.50 per 100 pounds f.o.b. shipping point plus dealer's commission. No. 1 roofing rags are $1.35; No. 2 roofing rags $1.25; No. 3 jute bagging $1.15; and No. 5A roofing rags $1.15.

Old Rope and Baggings

Market for old rope is steadier now that paper mills are once more showing an active interest in offerings. Mills are taking up foreign Manila rope at $6.00 to $7.00 per 100 pounds for the better grades. Domestic Manila rope continues $5.75 to $6.50. Jute strings are $4.50 to $5.00; No. 1 sisal strings $5.50 to $6.00 and Mixed strings $1.75 to $2.50.

Bagging market remains fair to good. Paper mills are taking up good stock and paying top prices for it. Domestic No. 1 gunny still brings $4.25 to $4.50 per 100 pounds to mills f.o.b. New York. Foreign No. 1 gunny is $4.75 to $5.00. Light wool tares are $4.50 to $4.75; and heavy wool tares $4.75 to $5.00. Bright bagging brings $4.25 to $4.50.

Waste Paper

Collections of all grades of waste paper for the first 29 weeks of this year exceed collections of the corresponding period of 1946 by 13.0 per cent. Waste containers continue to be the weakest spot in collections. Mill inventories of the news grades are currently at the highest point in the last two years. But current weekly consumption of old containers is higher than a year ago with inventories lower than at any time since V-J Day, and current collections are barely supplying enough for week by week requirements.

Most quotations for waste paper are steady at top levels. No. 1 hard white envelope cuts, one cut stay close to the $130 per ton level, baled f.o.b. New York. No. 1 hard white shavings, ruled are $100 a ton; and No. 1 soft white shavings are around $95.00. No. 1 heavy books and magazines are currently $25 to $30 a ton. No. 1 white ledger about $65 to $75. New 100% kraft corrugated cuttings $75 to $85. No. 1 News is currently $16 to $18; No. 1 Mixed Paper $15 to $17; and Box Board cuttings $16 per ton.

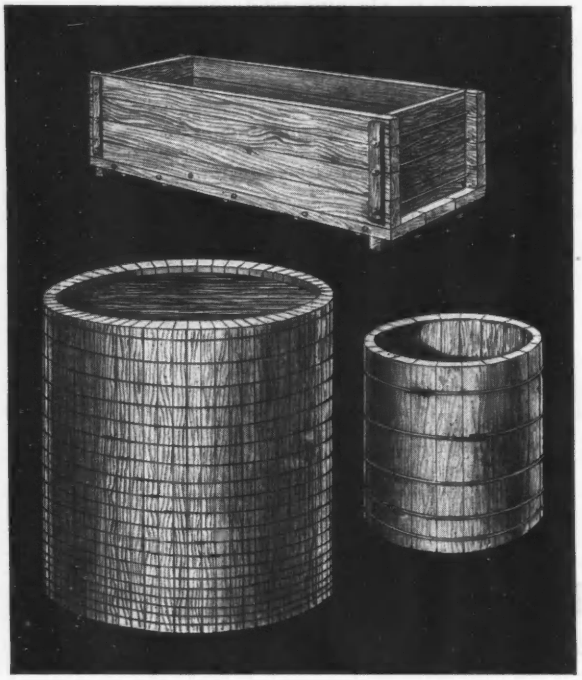
Oilgear's New Bulletin Tells About Small Transmissions

MILWAUKEE, Wis. — The Oilgear Company has published an eight-page bulletin illustrating and describing its new line of small fluid power variable speed transmissions up to three horsepower. Input speeds up to 1750 R.P.M. Output speeds variable from 0 to 1600 R.P.M. in either direction. Normal torque 90 inch pounds. Peak torque 135 inch pounds. Four styles of manual, hydraulic and hydro-electric control devices. Auxiliary hydraulic motors can be operated in series with these small transmissions.

NLRB Orders Election At Hooker Plant

NIAGARA FALLS, N. Y. — The National Labor Relations Board ordered a collective bargaining election before August 23 among lead burners, apprentices and helpers at the Hooker Electrochemical Company. Eligible employes, it was reported, will vote on whether they desire to be represented by the United Association of Journeymen Plumbers and Steamfitters and Lead Burners Local 677 (AFL), the Niagara Hooker Employes Union or by neither.

KALAMAZOO Wood Tanks



for ALL PAPER MILL NEEDS

Wood tanks are highly practical for certain uses, such as head boxes—blow pits—acid storage—fire protection, etc. Remember — Kalamazoo has specialized on Wood Tanks for over 75 years. This organization knows your industry and has facilities for supplying tanks of any size and shape, and in any wood desired. Lead or asphalt linings, corrosion-proof hardware, false bottoms, agitators, or any special type of equipment also supplied.

Send your specifications and we will be glad to quote prices.

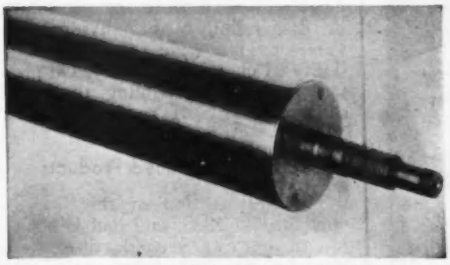
KALAMAZOO TANK & SILO CO., Kalamazoo, Michigan

YOU have an old paper machine roll . . .

YOUNGSTOWN has a special process . . .

INCO adds a specialized metal . . .

PUT 'EM ALL TOGETHER FOR NEW, TROUBLE-FREE LIFE!



MONEL-COVERED STEEL TUBE TABLE ROLL. Six-inch diameter by 157" face. Covered with ⅛" Monel sheet; then polished to a fine, smooth surface. A roll like this resists sagging and whipping. It insures against faulty web formation and reduces wear on Fourdrinier wires.

THIS SIZE PRESS RECEIVING DRYER is 4 ft. in diameter, has 118" face. Its ¼" Monel covering provides a smooth, dense surface which resists pitting and corrosion. *Photos courtesy of The Youngstown Welding & Engineering Co., Youngstown, Ohio.*

THESE ARE TYPICAL USES FOR MONEL-COVERED ROLLS

PAPER MACHINE

Dance Rolls
Dryer Rolls
Smoothing Press Rolls
Sweat Rolls
Paper Guide Rolls

FOURDRINIER

Table Rolls
Wire Return Rolls
Wire Shaking Rolls
Wire Stretch Rolls

AND . . .

Asphalt Shingle Press Rolls
Board Machine Press Rolls
Breast Rolls for press part of Wall Board Machine
Cold Roll Waxing Machine Chilling Rolls
Fibre Mill Dryer Rolls
Wet Felt Rolls
Water Waxing Machine Paper Guide Rolls

Here's a cost-saving recipe that's worth sampling:

Take one of your old paper machine rolls . . . steel or cast iron . . . bronze, brass or aluminum . . . any diameter, any length . . . *. . . and send it to be covered with Monel*.*

"Pressure Welding" plays no favorites. This patented process developed by THE YOUNGSTOWN WELDING & ENGINEERING COMPANY, 3700 Oakwood Avenue, Youngstown, Ohio, bonds to your original core a tough shell of smooth, corrosion-resistant Monel.

That one step just about doubles the hardness of the roll surface over that of commonly used non-ferrous metals. Naturally, it gives you better resistance to wear and abrasion.

At the same time, it packs in plenty of resistance to corrosion. For Monel withstands acid and alkaline paper machine white waters. It resists stocks, sizes and souring solutions such as muriatic acid and sulfuric acid.

This means Monel surfaces stay smooth. They don't favor the accumulation of fibre, slime and pitch . . . don't cause wet paper sheets and sizes to stick. And where wettability is important—on press rolls, for example—Monel-covered rolls carry ample water to the nip for a free release of the sheet.

Another point: Monel has no tendency to react galvanically. So you can use Monel-covered rolls safely . . . even in contact with copper and bronze under corrosive conditions.

There's no better proof of all this than your own experience. Let YOUNGSTOWN WELDING & ENGINEERING refinish one of *your* old rolls with a durable "Pressure Welded" Monel cover.

*Reg. U.S. Pat. Off.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

EMBLEM OF SERVICE
INCO
TRADE MARK

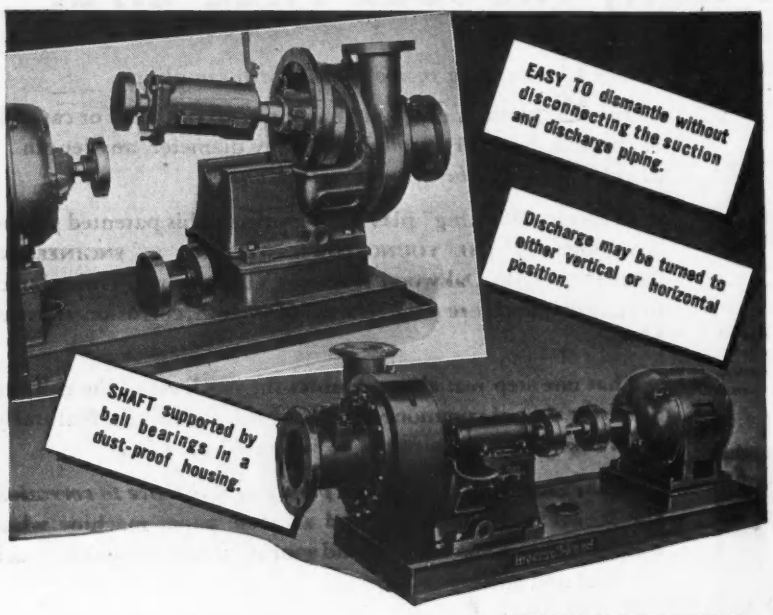
PMC Expands Operations At Milwaukee Plant

WILMINGTON, Del.—Hercules Powder Company will expand its operations at the Paper Makers Chemical department's Milwaukee plant. The expansion involves the moving of casein blending and grinding operations from Chicago to the Milwaukee plant which heretofore manufactured rosin size and other chemicals for the paper industry. The Chicago plant is being closed.

The casein, which will be tailor-made to customer specifications in the Milwaukee plant, is shipped from Hercules plants in Elroy and Durand, Wis., and Cambridge and Watertown, Minn.

David Gordon Heads Own Company

NEW YORK—"David Gordon & Company, Inc., Chemical, Mechanical and Industrial Engineers, 29 Broadway, has elected Mr. Gordon, previously with the M. W. Kellogg Company and the Interchemical Corporation, to the presidency of the company. The company is actively engaged in handling both domestic and foreign business.


EASY TO dismantle without disconnecting the suction and discharge piping.
Discharge may be turned to either vertical or horizontal position.
SHAFT supported by ball bearings in a dust-proof housing.

KEEP YOUR STOCK MOVING!

That's a sound merchandising principle; and it's even more to the point in the pulp mill where shut-downs can be costly.

I-R Stock pumps are heavy-duty units built expressly for continuous stock-moving service of all types—such as bull screen, blow-pit, and diffusor pumping, or broke-beater transfer.

These pumps are available with either closed or open impellers as conditions may require. For stock feed to the paper machine, they may be equipped with an auxiliary feeder propeller and a take-off in the suction nozzle to maintain a constant delivery regardless of the level of stock in the chest.

I-R Vertical stock pumps are recommended for situations where space is at a premium or where suction conditions would not be favorable for the horizontal type.

Ingersoll-Rand manufacturers a full line of pumps to fit every phase of pulp and paper making. Send for catalog 7022, "Centrifugal Pumps for Pulp & Paper Mills." Also call an I-R engineer—there's one near you—who will gladly discuss your pumping problems with you.

Ingersoll-Rand

10-991 Cameron Pump Division, 11 Broadway, New York 4, N. Y.

Quaker Chemicals Produces New Line of Esters

CONSHOHOCKEN, Pa.—The Quaker Chemical Products Corporation has begun the manufacture of Polyethylene Glycol Esters. These materials are finding ever increasing usage in manufacture of cosmetics, pharmaceuticals, paper, textile finishing materials, paints, inks, emulsion products, plastic articles and application also is indicated in manufacture of leather and adhesives.

The Quakesters are surface active agents of the non-ionic type. Certain specific members are excellent detergents, others are high in emulsifying power. Still other usages are dependent upon the esters as plasticizers and dispersing agents. Dependent on molecular structure water or oil solubility or dispersibility of individual esters varies over a wide range. Great flexibility of chemical and physical properties is possible enabling the meeting of a diversity of requirements.

Wood Pulp and Allied Products

The first edition of this book was published in 1938, and had it not been for the war, a second edition would have appeared in about 1940. Nevertheless, the war period has demonstrated fully the importance of the cellulose family in both war and peace, and in particular of its principal members, pulp, paper, rayon and certain plastics.

In revising this book, therefore, the author has considered it desirable to treat the subject so as to include the many and varied growing industries associated with the production of wood pulp and allied wood products. Particular attention is paid to by-products, because the indications are that these are likely to play increasingly important parts in the economics of the parent industries from which they are derived.

Apart from this, the treatment of the main subject follows the same general lines as in the first edition. However, here again, due attention has been given to a number of recent developments which may have far reaching effects on the industry. Examples of these are semi-chemical pulps, mechanical wood pulp bleached with a peroxide and the reinforcing of pulps with plastics.

An effort has been made to deal with these recent developments in a manner intelligible to readers who are not highly technical, but references to the original literature are provided for those who wish to follow specific subjects further. Other new features of this edition are the inclusion of illustrations and of an Author Index. In addition, the whole text has been revised completely and brought up to date.

Wood Pulp and Allied Products, by Julius Grant, Second Edition, Leonard Hill Limited, 17 Stratford Place, W 1, London, England. 25 s, 8 d.

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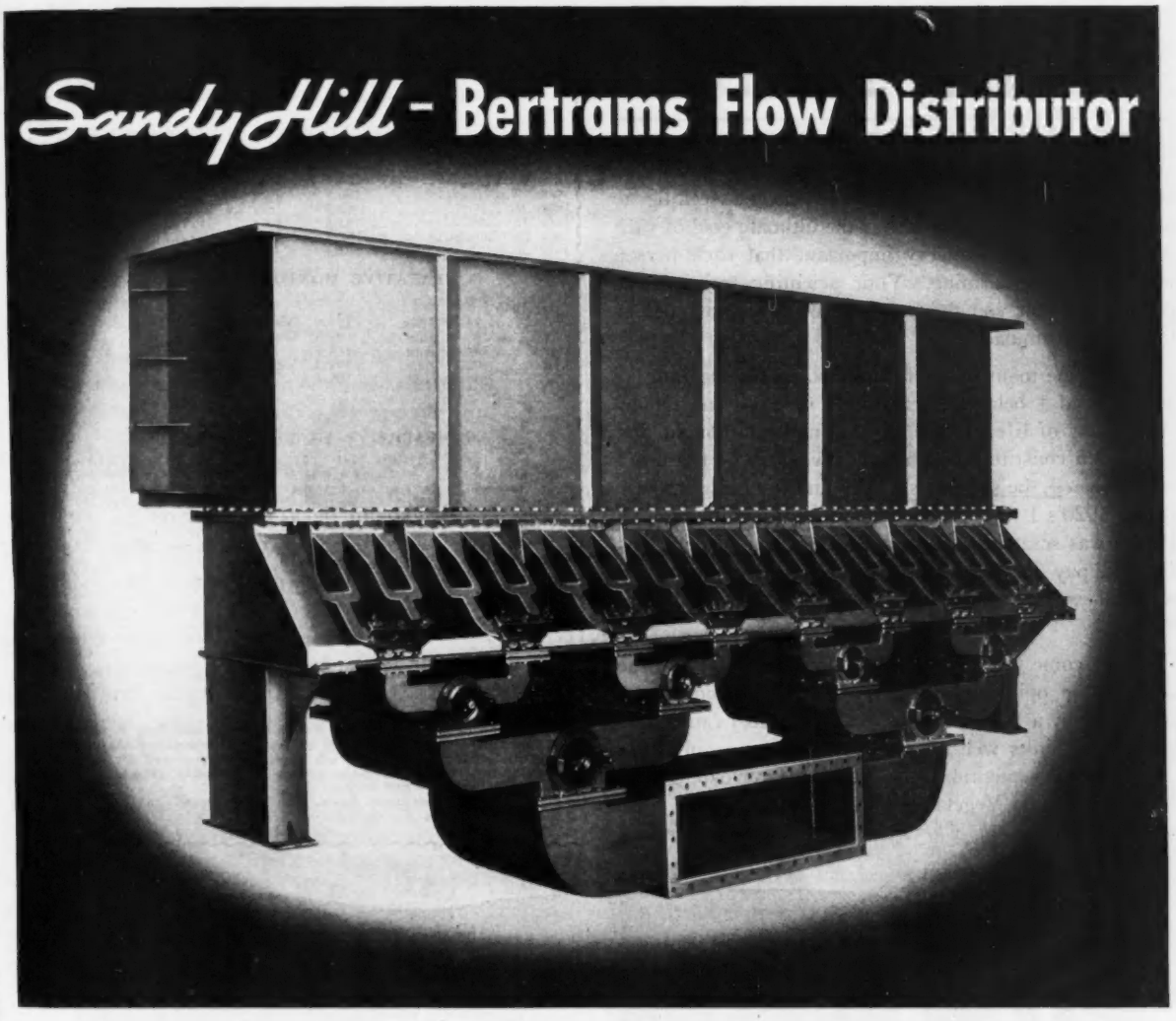

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Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
June 21	106.1	June 22	106.2
June 28	103.7	June 29	105.5
July 5	62.7	July 6	61.1
July 12	93.5	July 13	95.2
July 19 (Revised)	102.8	July 20	102.8
July 26	*105.4*	July 27	104.7

COMPARATIVE MONTHLY SUMMARIES

1946						1947	
Jan	94.7	June	104.6	Nov.	105.5	Jan.	102.1
Feb.	98.4	July	94.0	Dec.	97.0	Feb.	105.9
Mar.	104.4	Aug.	104.7			Mar.	106.1
Apr.	102.7	Sept.	101.3	Year Avg.	101.1	Apr.	105.1
May	100.7	Oct.	106.4			May	106.2
						June	*106.0*

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.9	93.6	95.2	87.8	87.4	87.9	99.3	*103.6*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

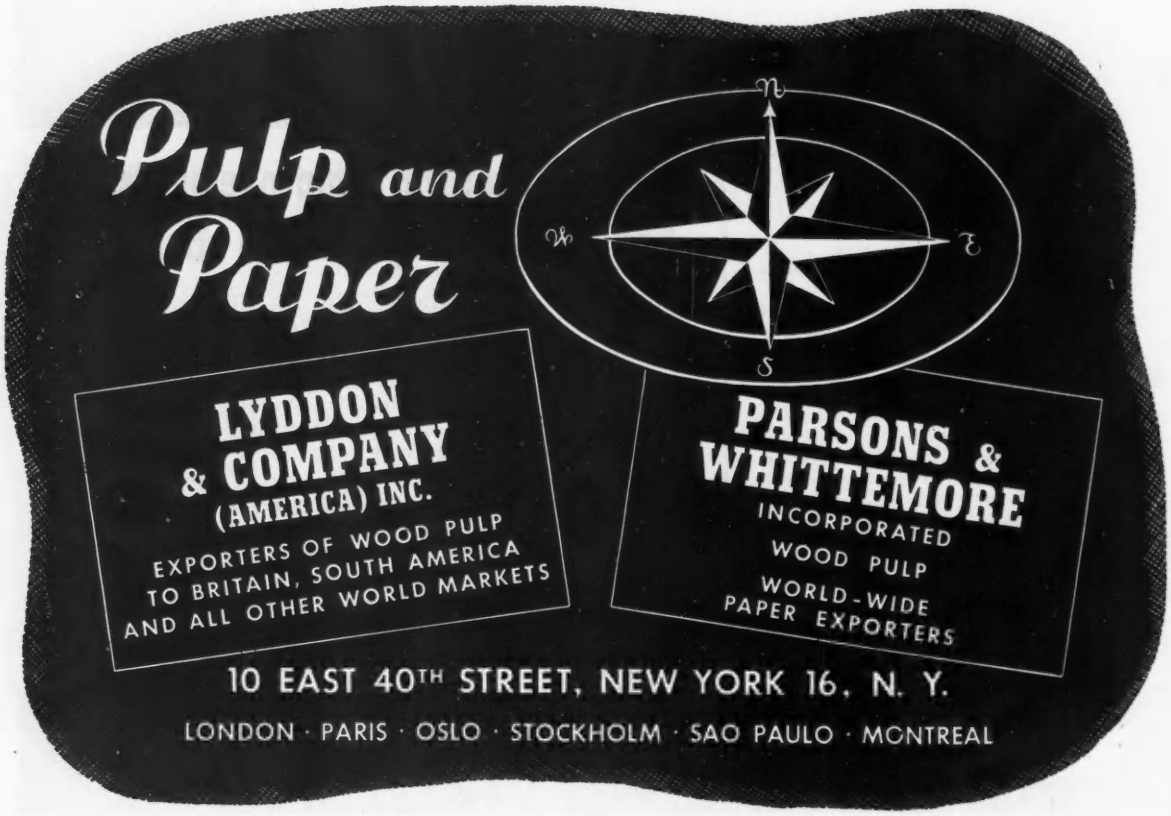
PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
June 21	102	June 22	97
June 28	102	June 29	98
July 5	78	July 6	70
July 12	76	July 13	87
July 19	97	July 20	94
July 26	*99*	July 27	95

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	99	96	100	99	92	96
1947	99	103	101	100	101	*101*							

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.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EDITORIAL

UNESCO Wants Newsprint Too

Without any desire to hamper the development of a worldwide prosperity and welfare through insistence on purely selfish ideas the pulp and paper industry never the less is watching with a doubtful reservation the future course of a world-wide demand for newsprint. So far, as was the case when newsprint began to appear in the headlines from Washington, the assumed demand appears to be largely in the propaganda stage. In witness of this there is the citation by sponsors of the movement that while the United States has 59 pounds of newsprint available for each inhabitant Britain has only 15.5 pounds, and that as against the average Canadian newspaper of 20 pages the British paper publishes only four pages. In this citation the proponents of a new division of the newsprint supply ignore the British Government's control over imports which keeps its papers to this small size. The whole project has been advanced in the trial stage by a group within the United Nations Education, Scientific and Cultural Organization, which it is said, proposes to make a report in Paris later in August.

Unequal distribution of newsprint, of which the United States consumes 65 per cent of the world's total supply, has prevented many citizens from being fully informed of world affairs and a number of nations from assuming their full responsibility in the world community because of the newsprint shortage in these countries, the UNESCO said. It continued:

"Newsprint rationing in many countries involves a great deal of official supervision, UNESCO concludes, "and Governments may be inclined to exert political pressure on the press by the exercise of these controls, which may have similar results as censorship. On the other hand, where newsprint is free, the wealthy newspaper can outbid its poorer rivals, with the result of strengthening the economic concentration, the effects of which upon the liberty of the press need not be stressed."

UNSECO lists the main reasons for the shortage as the loss of Japanese and German newsprint production, which before the war contributed ten per cent to the world's total supply; the shortage of coal production, slowing down industry; wood pulp for other uses; the need for timber in reconstruction and the use of wood as a substitute for coal, especially in Scandinavia; and the "enormous potential" demands for newsprint in India, China and other undeveloped countries with the spread of literacy.

The UNESCO said that New Zealand, with a population of 1,500,000, received the same amount of newsprint as India, with 338,000,000. In India, there is one newspaper to every 200 inhabitants, while in Denmark there are five printed pages for every citizen.

In Peru, Canada and Argentina, there are twenty pages for each daily newspaper; whereas, in Britain and France, there are only four. Last year, the UNESCO estimated, every individual in the United States had 59 pounds of newsprint; in Sweden, 36.5 pounds; in Britain, 15.5 pounds.

While the world's production dropped in 1946 to 6,800,000 tons, compared with 8,200,000 tons before the war, in a number of countries, such as France, the war has resulted in an increased number of newspapers and a greater demand than ever before for news, the report said. "The real exercise of the liberty of the press, both in the domestic and the international field, is conditional upon the solution of the problem of production and distribution of newsprint," the UNESCO concluded.

Hungry Hogs

To insect pests, fire, wasteful cutting and all of the other sources of forest depletion we must add the hungry hog, it now appears. This is on the authority of the Southern Forest Experiment Station at New Orleans, where the Forest Service has determined not only the fact of the damage but has been able to measure it.

The piney woods hog, one of the worst enemies of young longleaf pine, the Station's bulletin declares, in a contribution to the subject by Walt Hopkins, is popularly said to eat longleaf pine roots as a spring tonic.

Unlike cows, the Forest experts say, hogs can't efficiently convert fibrous roughage to body tissue. Ordinarily hogs get their carbohydrates from concentrates low in fiber. Of these, one of the finest is corn—80 per cent starch. Recent analyses show that the part of the root that hogs eat is 85 per cent starch and low in fiber.

A 150-pound hog (most woods hogs weight less) needs about five pounds of feed (dry weight) daily, the Forest Service finds and four of these five pounds should be a feed high in carbohydrates. As fresh longleaf root bark is about half water, the hog will have to eat about eight pounds a day. About 90 linear feet of lateral root provide this. A sow has been seen to strip 15 feet of root in 10-12 minutes. Thus a hog could get its daily needs in less than two hours.

A hog can destroy 400 young pines in a single day. One was timed uprooting and feeding on longleaf seedlings in the "grass stage" at the rate of six a minute. About 130 linear feet of seedling taproot or 210 seedlings will yield eight pounds of bark. The part of the root that the hog likes is very low in gums and resins. Hence longleaf root bark may be regarded as a nutritious though very expensive hog food rather than as a spring tonic.

W. L. Cook EDITOR

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122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

A General Study of Kraft Mill Instrumentation

By R. M. Brown[1]

Abstract

The article discusses in a general manner the application of indicating, recording, and controlling instruments to the various processes in a typical bleached kraft pulp mill. Each department is considered with some emphasis on the bleach plant and bleach liquor preparation instrumentation. The types of instruments used and the reasons for their use are discussed with some notes on the selection of instrument equipment, panel design, and layout.

The production of kraft pulp in this country and elsewhere has been increasing rapidly in the past several years and now forms a very impressive part of the total pulp output. Since kraft mills use a large number of indicating, recording, and controlling meters, it was thought that a general review of the instrumentation of a kraft mill would be of interest to engineers and operators concerned with this type of pulp manufacture. Detailed discussion of the instrumentation of the various departments could properly form the basis of subsequent papers and it is the intenion of the author to prepare such papers so that a fairly complete study of kraft mill instrumentation may be available. That such a series of papers would have to be supplemented from time to time is obvious. Even today new methods of controlling various processes are being introduced and may eventually be considered necessary to efficient operation.

It may be properly pointed out that an engineer who is considering the application of instruments to a process does so with two thoughts uppermost in his mind. First, will the use of instruments improve the quality of his product by the control of process variables? Second, will the use of instruments enable production to be increased? With these thoughts in mind, the instrumentation is worked out. Each application is studied carefully and the value of the instrument to the process is appraised. Too few instruments may result in losses both in quality and production. Too many instruments merely add to the capital cost without any return.

Adequate instrumentation makes other substantial contributions to plant efficiency. It has been found that new operators are more quickly trained when instruments are used; that operators' fatigue is reduced because guesswork is eliminated; and that the superintendent or engineer has more direct control over the process. With these preliminary remarks the study of the instrumentation of a fairly typical bleached kraft mill follows.

A kraft mill producing bleached pulp may be divided roughly into the following departments: (a) Wood handling and chip preparation, (b) Cooking, (c) Washing, (d) Screening, (e) Bleaching, (f) Drying, (g) Recovery, and (h) Steam.

The recovery department may be further subdivided into: (i) Evaporating; (j) Black liquor smelting—usually called recovery; (k) Lime burning; and (l) Causticizing or recausticizing, to be more correct. A very important feature, the water supply will be neglected. Each of these departments has instruments and controls of one sort or another.

In the woodhandling and chip preparation department, there is used a continuous chip weighing device generally referred to as a weightometer. It is a scale rather than an instrument, yet these scales will have a totalizer to integrate the weight of the chips being carried by the conveyor, a loading-out counter by means of which the conveyor is stopped after a certain preset weight of chips has passed over the scale, and may have a remote recorder or remote indicator to record or indicate the instantaneous rate of flow of the chips in tons per hour.

Cooking

In the cooking department there are the digestors and adequate controls are important if uniformity of output is to be maintained. Control systems have received a lot of study both by the mill engineers and by the instrument companies and several types are available. There is no doubt that new methods of control will be introduced. The type of control system will be determined largely by what method of heating and circulating the liquor is used and what type of wood is being cooked.

In any case, the use of some form of temperature-pressure relation relief control is required. Such a controller measures the actual digestor pressure and at the same time measures the steam pressure corresponding to the particular or instantaneous digester gas temperature. If a difference exists it may be assumed to be due to the presence of air or other non-

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[1] Instrumentation Engineer, Stadler, Hurter, & Co., Montreal, Que.

condensible gases and the digester relief valve opens to bring the pressure down to the correct steam pressure. If the digester has a circulating system with an external liquor heater, temperature control of the liquor may be accomplished either by means of a temperature control system with a sensitive bulb located in the liquor line and a control valve in the steam line to the heater, or it may be accomplished by means of a pressure control system with the digester pressure being used as a control variable. The steam control valve as before would be located in the steam line of the heater. Proponents of the pressure cooking method point out that at the temperature at which cooking takes place, the pressure corresponding to the temperature varies almost 2 pounds for every degree change in temperature and that the pressure basis is therefore the most sensitive. If direct steaming is used to heat the liquor, the pressure basis of control is generally used.

If indirect heaters are used, condensate level controllers are, of course, required. To detect leaking tubes in the heat exchangers, a condensate conductivity controller is used in conjunction with a three way valve in the condensate line. If liquor is present in the condensate, an alarm sounds to warn the operator, and the three-way valve changes position so as to divert the contaminated condensate to the sewer.

It might be mentioned here that most control systems take into account the fact that there is a marked tendency for foaming to occur, principally in the early stages of the cook, and that liquor may be blown over in the relief. In one system the method of preventing liquor losses is to blow steam back through the relief line until the condition is corrected. In another, a cycle controller acts to open and close the relief valve intermittently, during the heating-up cycle, after which the control is based on actual digester pressure.

In a third system, no special instrument or control provision is supplied, a separator being used to trap the liquor.

It should be noted that foaming, hence liquor blow-over, is more commonly encountered when cooking southern woods than when cooking northern woods. In Canadian mills for example, it is not common practice to use liquor pull-over prevention means. The only foaming that does occur to any extent is that occurring at the blowdown and this may be lessened materially by blowing at full digester pressure.

The cooking liquor mixing control system may be mentioned briefly. The purpose of such a control system is to have the proper proportions of white and black liquor mixed together to form the cooking liquor. This system consists of one or two contact making level recorder controllers operating motor starters for the liquor and transfer pumps and operating shut-off valves in the liquor lines. Some means of interlocking the pump motor starters is desirable to ensure that the pumps operate in the proper sequence. Level must be maintained within very close limits. A 1-inch variation in level in a large tank represents several cubic feet of liquor.

Washing

From the digesters, the pulp goes to the blow-tank which may be in the digester room or in the pulp washing department. It should have both a level recorder and a level indicator, and a dilution controller. The level recorder is located in the pulp washing department and the record shows the trend of level so that the operator there may adjust his washer feed. The indicator, located in the digester room shows the operator there whether he has room in the tank for the blow. The dilution controller, taking variations in power in the agitator motor circuit as a measure of consistency, operates a control valve in the dilution liquor line to reduce the consistency from about 12% down to about 3.5%. At this consistency it is pumped to a combination consistency controller and stock meter ahead of the line of brown stock washers, in which the consistency is reduced further. As a rule, there is no consistency recorder on this consistency controller, but on the stock meter a recording tachometer is of great value in setting the paper rate of feed of stock to the washers.

The brown stock washers are equipped with press roll load controllers, of which several makes are available. Usually these are supplied with the washers. The controllers use air pressure in a pneumatic cylinder or diaphragm operator to supply the loading pressure through levers to the rolls instead of using a spring. The cylinder air pressure multiplied by the lever ratio gives the pressure on the roll. Washers may be equipped with several press rolls, each separately controlled, the number depending on the amount of water to be removed. Indicating flow meters on the black liquor filtrate lines to the washers enable the operators to preserve uniform washing conditions. A recording flow controller on the hot water to the last stage is useful in checking the wash liquor balance in the system. Level recorders on the black liquor filtrate tanks, washed stock chests, etc. are essential.

It should be noted here before going further, that most mills have installed heat recovery systems on the digester blow gas lines. A condenser is used, the useful heat from the gases being absorbed by cold water which is thus heated and used in washing. The flow of cold water is controlled by valves, these valves in turn being controlled by temperature controllers, or a combination of temperature and pressure controllers. The object in both systems is to start the cold water flowing as soon as the hot gas starts coming over and to control the flow so that uniformly heated water results. Blow heat recovery systems may be either intermittent or continuous types, the only difference being in the valve sizes. In the latter type, the valves may be smaller.

In the screen room level recorders or indicators on the various chests are the only instruments used, as a rule.

Bleaching

After being washed and screened the stock goes to the bleach plant. In this department a large number of instruments are used, but fortunately for purposes of description, the instruments form groups which repeat themselves. The instruments on one stage are similar to the instruments on another stage, for example.

Neglecting the stock for a moment, consider typical bleach liquor preparation. In the bleach mixing tanks, water, chlorine and lime are mixed together to form calcium hypochlorite. The amount of chlorine required to give bleach liquor of the proper strength is roughly proportional to the temperature rise, being about 0.6° F. per gram per liter, i.e. a 50 gram per liter solution would show a temperature rise of 30° F. A recording thermometer is therefore of value. If more than one mixing tank is used, or if the tanks are used alternately for mixing and sludge washing, a multiple pen thermometer is required. A pH recorder is of definite value in measuring the strength of the bleach liquor. The instrument is so arranged that the

circulating pump continuously circulates a sample of the liquor through the electrode assembly.

After being mixed and the sludge has settled, the bleach liquor is decanted into bleach storage tanks equipped with air bubble level recorders. From here the liquor is pumped to the hypo tower or more correctly to the inlet of the high density pulp mixers ahead of this tower. It is metered on the way by a rotameter. The chlorine to be used in the chlorination towers, acid towers and hypo absorption tower, if used, is first vaporized and the pressure controlled by means of an indicating pressure controller. The chlorine is also metered by rotameters in the various lines. The caustic solution at a nominal strength of 50% is pumped to a caustic dilution system. Here the caustic is diluted by the addition of filtered water to a strength desired. The dilution controller may be a volumetric type ratio controller, proportioning the correct volume of caustic to the water, or it may be a density control system in which the density or specific gravity or the system is automatically checked and corrected. Of the former systems, the rotameter type is convenient to use, while of the latter a density controller incorporating a float rising or falling in a sample of the solution seems to hold promise. In any of these systems, temperature and pressure should be held to close limits to get the accuracy desired.

If a hypo absorption tower is used for the production of sodium hypochlorite, a differential temperature recorder controller is used. The rise in temperature is a measure of the strength of the hypo and is controlled by operating a valve in the chlorine line to the tower. The two bulbs of this instrument are located near the bottom and near the top of the tower, the object being to maintain a constant rise or differential, regardless of the temperature of the incoming caustic.

So much for the chemical instrumentation. On stock flow, the first instrument encountered is the recording tachometer for the stock meter. This instrument is an important item as it measures the rate of flow of stock to the bleaching process. One or more may be used, depending on the number of stock meters used.

From the meters the stock, at a consistency of about 3.5% flows to the low density pulp mixers where the chlorine is added and thence to the chlorination towers. As the flow in these towers is from bottom to top, the stock overflowing at the top, no level recorders are necessary. Also, as chlorination takes place necessarily at comparatively low temperatures, no temperature recorders are used.

The stock after a suitable retention period, is pumped to the washer being diluted on the way to a consistency of 1% lower. All the washers are equipped with press load control systems as on the brown stock washers. The exception to this statement may be the last stage washer when the stock is not thickened as much and press rolls are not used.

It is not necessary for the purposes of this discussion to dwell upon the bleaching processes in detail. After the first low density stage, the remaining stages are high density ones, the stock being thickened in the washers. Consistencies range from 17 to 22% in some cases. In each case, the high density stock coming out of the tower is diluted down to 1% or lower before reaching the washer, this dilution being accomplished in three steps, down to 10% in the bottom of the tower, to 3% in the dilution chest and to 1% in the stock line to the washer. The flow of dilution liquor is set by means of a Saunders or similar valve, equipped with a pneumatic or hydraulic cylinder for remote operation. These cylinders should be equipped with valve positioners so that the operator in setting the positioner of the valve may set it exactly at the opening required, and also so that the valve opening will not be changed due to changes in line pressure.

Since the action in the bleach tower takes place best within a certain temperature range, recorders are used to measure the temperature of the stock entering the tower and leaving the tower. In the case of the caustic towers, the temperature of the stock entering the tower is controlled, steam being admitted to the pulp mixer through a control valve. The bottom temperature in the caustic towers is not controlled but serves as a check on the proper control point setting.

Level recorders on the high density towers are desirable, but the writer does not know of any satisfactory way of measuring levels in stocks of 17% consistency or higher. Information on a satisfactory method would be appreciated. Currently, a diaphragm operated pneumatic transmitter is being investigated. Level in the dilution chest may be recorded by means of a bubble type instrument.

This completes the instrumentation of the bleach plant except that the level in the bleached stock chest will probably be measured. In some bleaching systems, a record of temperature in the final soaking towers is desirable.

From the bleach plant, the bleached stock may go directly to the driers or may first go through another screening operation. Level recorders on the bleached screened stock chests are used. In the drying department, the steam pressure to the driers is controlled. Steam flow may be recorded if desired. Recording tachometers measure the speed of the driers. Level controllers on the separator chests and some controls on the condensate system are in general use. Low pressure steam to the predriers may be controlled by means of a spring-loaded reducing valve. This pressure is not critical. Press roll load controllers on the presses, a vacuum recorder on the suction mold and a level recorder on the cylinder mold pretty well completes the instrumentation of this department.

Recovery

In the recovery department, made up of the evaporators, recovery furnace and recausticizing department, many more instruments are used. The evaporator instrumentation consists of a level recorder for the weak liquor storage tank, a steam flow recorder controller for the steam to the evaporator, condensate level control, conductivity alarm system and bypass valve for the condensate line and a means of measuring the temperatures at various points in the system to determine heat transfer efficiency, detect fouling of tubes, etc. There are systems available using Baumé recorder controllers on the thick liquor which automatically reset the control point on the liquor flow controller and which are claimed to give almost continuous automatic control of the evaporators. These systems are still being tried out in the field and the writer has had no personal experience with them. There seems to be no good reason why satisfactory Baumé recorder controllers, which form the basis of control, should not be developed in time.

From the evaporators the strong liquor goes to the recovery furnace, passing first through a cascade type evaporator. From a consistency of 45 to 50% solids, the liquor is thickened to a consistency of 70% solids in the evaporator. The level in the evaporator is held constant by means of a temperature controller, the

bulb of which is either covered by the liquor or partly exposed to the hot gases from the furnace. A control valve in the feed line admits more or less liquor. Excellent level control results from the use of such a controller.

Although no means are provided for actual control of consistency of the liquor in the evaporator, some indication of abnormal conditions is provided by the use of recording ammeters on the cascade motor circuits and a wattmeter on the common supply. Whether a potentiometer controller operating from variations in the power drawn by the motors could be worked out is somewhat doubtful although this method has been proposed. If the liquor in the cascade becomes too thick it may smelt at the hot end. The control of consistency is another problem in instrumentation that requires a lot of study.

The flow of the thick black liquor to the furnace is not easily metered. There is a decided tendency for the salt cake in the liquor to crystallize out should the temperature drop, plugging up orifice plates or flow nozzles and also purge line openings.

The list of instruments on a recovery furnace is quite large, but almost all of these are supplied with the furnace and help to provide efficient operation. They consist principally of draft gages, steam flow and air flow recorders, temperature recorders and controllers, etc. The only additional instruments the mill supplies may be level recorders and a beaume recorder control on the main dissolving tank. The latter insures that the green liquor going to the recausticizing plant is up to the proper Baumé.

In the recausticizing plant level recorders, torque recorders, etc. are used. As most of these causticizing plants follow the Door system their recommendations as to instrument equipment may be followed. The lime-burning kiln also comes supplied with pyrometers, etc., and little need be said here on these. They are fairly standard items of equipment. On very long kilns, and these are becoming more common, the temperature at several points along the kiln may be desired. In this case, a multiple-record pyrometer is used, with the temperature in the rotating kiln taken by thermocouples wired to commutator-type rings against which contacts slide. These contacts are in turn wired to the recorder.

In general, this completes the list of instrument applications as far as the process is concerned. The instrumentation of the boiler room will not be covered by this paper as it deserves special study. The matter of meters for Parshall flumes, sewer loss recorders, and departmental steam flow meters have also been omitted. These latter meters really come under a study of the economics of operation, which the author does not feel qualified to discuss.

Before concluding the paper, it may be in order to add a few notes concerning the selection of instruments, and their location.

Instrument Selection

Briefly, it may be stated that cost alone should not be the sole basis in the purchase of instrument equipment. There are many companies manufacturing instruments and valves, and the prices range from low to high. In general one gets that for which one pays. The author's advice is to deal with one of the well-known companies, who have been established for years, and who have adequate sales and service facilities. If a choice is to be made between two or three makes, select the one made by a company experienced in the application under consideration. One company, for example, may be outstanding in digester control, another may excell in pH applications. Remember that the sales engineers of the instrument companies can be of great assistance to the instrumentation engineer, and that their advice is generally good.

As regards location of instruments, the trend is definitely towards centralized grouping of instruments on panels. This has reached the point at which "packaged units" are common, that is the instruments necessary for the control of a certain process completely mounted on an attractive panel. The instrumentation engineer will, however, have to consult with the operating engineers to decide what instruments, push button stations, signal lights, etc., are to be mounted on the panel and the location of the panel itself.

The centralized location of instruments emphasizes the importance of pneumatic or electrical telemetering systems. These have come into wide use since their introduction. If economic consideration permit, the use of such systems make for easier installation and lower repair costs.

Natural Waxes

The Reinhold Publishing Company has recently issued an interesting and popularly written book entitled "Adventures in Man's First Plastic — The Romance of Natural Waxes," by Nelson S. Knaggs of the Hilton-Davis Chemical Company Division, Sterling Drug, Inc. (329 pp. 6 x 9).

This is a subject on which relatively little has been written, although the products have been articles of convenience for centuries. When the war brought on a shortage of waxes, the author was commissioned by the Government to travel and locate sources. This took him through various Latin-American countries. His studies brought him the listing of natural waxes from hundreds of natural sources. The work is far from being a text book. Much of it deals with his own travel experiences and research.

Included as subject matter are: Wax Through the Ages; Brazil's Tree of Life; Spermaceti Wax; Shellac; Chinese Insect Wax; Esparto Wax; Beeswax; Montan Wax; Paraffin; Bayberry; Cotton Wax; Sugar-Cane Wax; Synthetic Waxes, Chlorinated and Hydrogenated Products; Properties of Waxes.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $6.75 per copy.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Arthur F. Bolles, Sales Engineer, The Dicalite Co., Chicago, Illinois.

Ivan D. Campbell, Instrument Engineer, Puget Sound Pulp & Timber Co., Bellingham, Washington. Attended the University of Idaho.

Ralph Collins, Technical Representative, James Kenyon & Son Ltd., Derby Street Mills, Bury, Lancashire, England, a 1940 graduate of Battersea Polytechnic Institute.

Robert B. Fellows, Sales Manager, Reichhold Chemicals, Inc., Tuscaloosa, Alabama, a 1936 graduate of Michigan State College.

Carl L. Hackbarth, General Superintendent, Sociedad Agricola Paramonga, Supe, Peru.

Sources of Variability in Water Vapor Permeability Determinations*

By Maynard S. Renner[1]

Abstract

An experiment was conducted to try to identify the sources of variability in the measurement of water vapor permeability at high temperature and high humidity (TAPPI T464m-45). The experiment was designed to permit of examining the data obtained by means of variance analysis. One film only (Pliofilm substitute) was used in the experiment. Sources of variability studied were the days on which weighings were made, positions on each of the three shelves in the cabinet, shelves, and the various interactions. The major part of the variability was assignable to the days, although positions, shelves, and the interaction between positions and shelves made significant contributions to the total variability. The low value of the triple interaction, which included the error of the experiment, indicated the relative unimportance of variables other than those named above and the relative uniformity of the film used in the test.

Wartime packaging requirements not only developed new standards of performance in protection from penetration of water vapor but also greatly increased appreciation of the importance of such protection. Since the end of the war interest in this subject has been maintained or increased, due in part to war experience, in part to development of new uses and new fields for packaging products, and in part to the development of newer types of materials. Hence, the problem of obtaining a fair estimate of the rate of transmission of water vapor of any given material to be used for packaging has become increasingly important.

A wide variety of tests for obtaining such an estimate have been proposed *(1)*. One widely accepted commercial test is the accelerated test run in a cabinet at 100°F., containing air at 90 to 92% relative humidity *(2, 5)*. In this test a membrane of the material under examination is sealed across a metal cup containing desiccant in such a way that a known area of the membrane is exposed. The cup-membrance assembly is then placed in the humidity cabinet and at intervals is removed for weighing to determine the gain in weight as a measure of the amount of water vapor transmitted through the membrane under these storage conditions. This gain in weight is then reduced to a standard area and time basis, usually either 100 sq. in. or 1 sq. meter per 24 hours. The value so calculated is spoken of as WVP, i.e. water vapor permeability.

It is recognized that this method, although widely used commercially, does not show the high degree of reproducibility expected of chemical gravimetric determinations; rather, it shows a definite lack of consistency from one determination to another *(4)*. Thus it is not unusual to test four samples at a time of a given material in order to be able to average out some of the lack of consistency for a final estimate of WVP. Tests are also prolonged over a series of days in order to be more certain of arriving at an accurate estimate. In general, it is believed that this lack of consistency has been a source of concern to all those laboratories doing water vapor permeability testing.

It would be desirable to know more about the sources of this lack of consistency, or variability as it will be called in this paper, and to obtain a quantitative estimate of its magnitude. Once these sources in so far as they lie within the test itself are known, there should be at least a chance of reducing the variability of tests by modifying either the testing procedure or the cabinet to eliminate or to reduce the variability producing effect of the major sources. Once the magnitude of the variability is known, there are means available for estimating the quality of the testing procedure and the extent to which the differences found between materials are due to actual differences in the materials under test rather than to testing variability alone. In the course of setting up a new humidity cabinet for WVP determinations a test was designed and run in order to study this variability.

Apparatus and Procedure

The cabinet used was of special design. A sketch is shown in Fig. 1. It was operated at 100°F. and 90 to 92% relative humidity, conditions specified in the TAPPI High Temperature and Humidity Test (T464m-44) *(5)*. A special cup was used as shown in Fig. 2. The area of film exposed in this cup is 5.81 sq. in. so that the gain in weight per 24 hours in grams must be multiplied by 17.2 to give WVP in grams per 100 sq. in. per 24 hours. Five cups were prepared for each of the three shelves in the cabinet. A cup was placed in each of the four corners and in the center of each shelf.

In order to minimize the errors that might be due to differences in the packaging material tested, it was decided to use a single material in all of the cups. Synthetic Pliofilm (0.0017 to 0.0020 in.) was chosen because of its nonhydrophilic nature, as compared with cellulose products generally, and also because a large supply of the film was immediately available.

The samples were first put in the cabinet on a Friday and conditioned over the weekend before weighing, so that they received 72 hours conditioning before the first weighing. They were then weighed for 6 consecutive days to give a total of six 24-hour gains in weight for each cup, or a total of 90 weight-gain values. Weighings were made immediately upon removal from the cabinet without dessicator storage.

Results

The data obtained are given in Table I. These data are individual gains in weight in milligrams for each cup per 24 hours. The gains in weight or pick-ups for each day are listed in columns. The

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Dewey and Almy Chemical Co., Cambridge, Mass.

gains in weight for the different layers or shelves are listed in each of the three horizontal boxes. The gains in weight for each position on each shelf are listed in rows across each of the three horizontal boxes. The daily mean or average of all position-in-layer values is given at the bottom of each column; the average of all daily values for each position-in-layer is given at the right-hand side of each row.

The mean gain in weight per 24 hours of all 90 values is 30.2 milligrams. This value when multiplied by 0.0172 to convert to grams per 100 sq. in. gives a WVP value of 0.52 which corresponds exactly with the value given by the Goodyear laboratories for this sample. It also corresponds closely with the value of 0.54 obtained by another commercial laboratory on a sample cut from the same sheet from which these samples were taken. Hence it would appear that average WVP values, at least when based upon a large enough number of samples, can be reproduced.

However, a close scrutiny of the individual values in Table 1 would seem to be confusing rather than helpful because of the variability present. They vary widely, either from day to day or from position to position in the cabinet. Even averages for any given day over all positions, or for any given position over all days vary widely. Thus it would appear that testing two samples for 6 days in position 3, layer 1, and position 5, layer 2, would have given a value 6.2% higher than the mean value actually found; testing two samples in positions 1 and 2, layer 3, would have given a value of 8.3% lower than the value found. If fifteen samples had been run for 1 day only (which would have been unlikely) still wider variations would apparently have been obtained, depending upon the days chosen.

A large part of the confusion arising from examination of the data in detail can be resolved by the use of the technique known as variance analysis.

Variance and Variance Analysis

Variance, as used here, is a word which has a precise meaning in statistical theory. It is a quantitative mathematically determined measure of a quality of data known as variability, much as "% Acid as HCl" might be said to be a quantitative chemically determined mesure of a quality of a solution known as acidity.

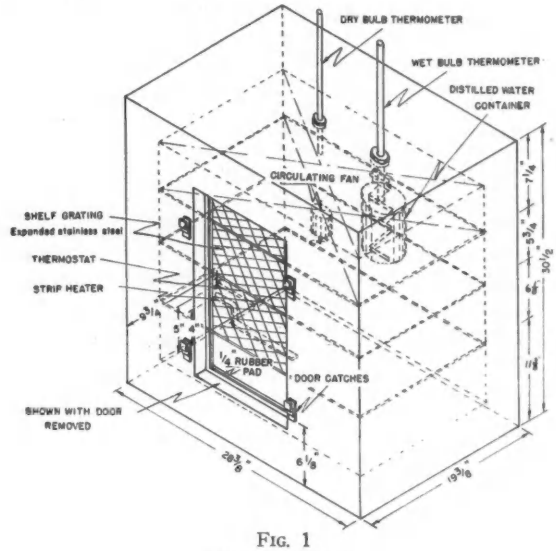

FIG. 1
Humidity Cabinet

TABLE I.—WEIGHT-GAINS OF WVP CUPS (IN MILLIGRAMS)

Layer or Shelf	Position	Days 1	2	3	4	5	6	Average
1	1	31	29	33	30	28	35	31.0
	2	30	27	32	30	28	34	30.16
	3	32	28	34	32	30	36	31.66
	4	31	31	33	30	30	34	31.5
	5	28	29	30	32	29	32	30.0
2	1	27	27	30	29	29	33	29.17
	2	30	30	34	29	29	36	31.33
	3	25	29.5	31	28	27	32.5	28.83
	4	29	30	33	30	28	33	30.5
	5	27	34	34	31	32	37	32.5
3	1	25	28	30	27	22	31	27.0
	2	25	30	29	27	27	32	28.34
	3	27	28	30	29	29	33	29.33
	4	28	32	32	30	26	35	30.5
	5	28	29	31	28	29	32	29.5
Mean		28.2	29.4	31.6	29.4	28.2	33.7	30.2

But what is variability? Study of the original pick-up data in Table I should give some insight into the nature of variability. There should have been no variability if all of the pick-up values for all positions, shelves, and days, had come out exactly alike. The grand mean or average value would have been exactly the same as any individual value, and there would have been no room for uncertainty or discussion as to what the WVP value should have been. But unfortunately this experiment, as do most experiments, gave data of an entirely different type in which there was a wide dispersion of individual pick-up values on both sides of the mean, and it is this dispersion which is spoken of as variability.

Variability is a characteristic of all data as most experimentalists have come to learn through sad experience. (Chemists seem particularly unwilling to accept the existence of variability, probably because of early training in the simpler methods of quantitative analysis in which the methods are much more precise than the requirements). The magnitude of the variability of a set of data can be determined rather simply by calculation of its variance.

Methods of calculation of variance and discussion of what to do with it once it is calculated are given in many texts on statistics. Some of the most readable and helpful are Freeman's "Industrial Statistics," Ryder's "Introduction to Modern Statistical Theory," and Snedecor's "Statistical Methods." Ryder defines variance as follows: "the variance of a set of quantities is the sum of the squares of their deviations from their mean divided by their number." *(3)*. This definition, though simple, is applicable only to large samples—for small samples such as are discussed here, the divisor is the number of degrees of freedom, or independent values from which the sum of squares is made up, which in the simple case is one less than the number of quantities.

By the use of calculations of variance, it becomes possible not only to obtain an estimate of the overall variability, but if the experiment is well designed, to analyze the variability into its component sources, and to determine how much of the total variability present in a set of experimental data arises from each source. This procedure is known as variance analysis.

Results of Variance Analysis and Discussion

Table II presents the results of the analysis of variance of the data of Table I. (To justify this treatment with those familiar with statistical theory, it should be stated that these data have been tested for homogenety and found to be homogeneous with a high degree of probability).

In Table II, the first column lists the possible sources of variability which were intentionally included in this experimnt, not only the single sources of each variable, but also the joint sources or inter-

actions of one variable upon another. The second column lists the sums of squares of deviations. For the single sources these values are obtained quite simply. They are merely the sums of squares of the deviations of various means from the grand or overall mean. In order to show how such values can be obtained, the means for each day, position and layer are shown below the main table in Table IIA. Sums of squares of deviations for the interactions are computed by a slightly different procedure which is entirely routine but considered too complicated for discussion here. The degrees of freedom column lists the number of independent values from which each sum of squares is obtained here. The mean square column lists the variance assignable to each source. The ratio column has to do with the so-called F test which is discussed below.

Examination of the values listed in the mean square column shows that the sources of variability to be studied were chosen wisely, since by far the largest portion of the variability in the data can be immediately assigned to the days and layers in the cabinet, the days being most important. Both positions and the interactions of layers and positions appear to have some importance.

The other joint effects, however, make a relatively small contribution to the total amount of variability The triple interaction is also small. Hence, it seems safe to assume that the real error of the experiment is also quite small, and that the value for the triple order interaction found here may be considered the error of the experiment. Then when each of the mean square values, excepting the last one, is divided by the last one (triple order interaction or error term) the values given in the ratio column are obtained. Applying the F test to these ratios, it is found that all of the single effects and joint effect of layers and positions are significant beyond the 1% level; i. e., their contribution to the total variability is greater than could have occurred by chance. The joint effect of days and positions is not significant and the joint effect of days and layers lies just below the 5% level and is probably not significant; i.e., it may be due to chance.

These conclusions are, in general, in accord with what one might expect. The cabinet, for the period of this test, was stored in a laboratory where it was exposed to varying room temperatures. Consequently, there should be rather wide day to day variation in water vapor pick-up because with lower outside temperature one might expect lower interior wall temperature, and hence, lower interior relative humidity. It also seems reasonable to expect variability due to the position within the cabinet as well as to the layer on which any given sample is placed. Probably this variability is traceable to differences in circulation of air and in moisture content of the air circulating over

TABLE II.—ANALYSIS OF VARIANCE

Source of Variability	Sums of Squares	Degrees of Freedom	Mean Square	Ratio
Days	355.36	5	71.07	41 **
Layers	63.36	2	31.68	18 **
Positions	33.49	4	8.37	4.8**
Days × layers	38.24	10	3.82	2.18
Days × positions	27.98	20	1.39	0.80
Layers × positions	77.98	8	9.75	5.61**
Days × layers × positions	69.75	40	1.74	.....
	666.16	89		

TABLE IIA.—DAY, LAYER, AND POSITION MEANS

Days	1	2	3	4	5	6
Means of days	28.2	29.4	31.6	29.4	28.2	33.7
Layers	1	2	3			
Means of layers	30.9	30.5	28.9			
Positions	1	2	3	4	5	
Means of positions	29.1	29.9	29.9	30.8	30.7	

Grand Mean—30.2 milligrams

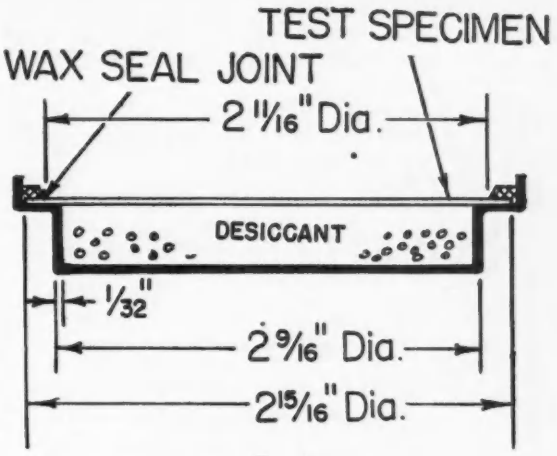

FIG. 2
Test Cup Used for Determinations

different samples at different positions in the cabinet.

The results of the analysis of variance show qualitatively the desirability of continuing an experiment over a number of days for a more reliable estimate of WVP. They also qualitatively indicate the desirability of running samples for comparison in the same layers and in the same positions throughout the course of an experiment.

Because the value of the triple interaction which includes the error of the experiment, is so small, it would seem safe to conclude that there is little variability in the cabinet other than that assignable to positions, layers and days; that the Pliofilm itself can be considered uniform; and that variations in weighing techniques or moisture on the cups makes no important contribution to the variability.

In order to get a better understanding of the relative importance of the different sources the following estimates of "population variances" were computed:* (1) between days within layers and positions, (2) between positions within days and layers, and (3) between layers within days and positions. These results are given in Table III. It is seen that days are by far the most important source of the total variability, and that the other effects, although significantly large as shown in Table II, are nevertheless negligible in comparison with the days.

* Using these formulas:

$$V_D = LP\sigma_d^2 + \sigma_e^2$$

$$V_P = LD\left(\frac{P}{P-1}\right)\sigma_p^2 + \sigma_e^2$$

$$U_L = PD\left(\frac{L}{L-1}\right)\sigma_L^2 + \sigma_e^2$$

The factors $P/P-1$ and $L/L-1$ are inserted in the last two formulas to correct for the fact that there is only a finite number of both positions and layers. The days are assumed to be drawn from an infinite sample.

The standard error of the mean has been computed and found to be 1.096 mg.* This value would indicate that there is a 95% probability that the true mean for this film, tested under these conditions, lies between values such as to give WVP's between 49.88 and 54.18.

There are certain limitations inherent in this experiment. As has been pointed out, the film studied was chosen because of its nonhydrophilic nature. There are at least indications that more hydrophilic films might show greater sensitivity to changes in

relative humidity. The cups used were small cups having an exposed area of 5.81 sq. in. rather than the 20.63 sq. in. area of the GF WVP cup. The humidity cabinet was of special design and undoubtedly the GF WVP cabinet or other cabinets and package testers will show different characteristics.

Further work of this type is planned, if and when time permits, with hydrophilic films, larger cups and, if possible, other cabinets. It is also planned to study changes in the cabinet with a view to reducing or eliminating the various significant sources of variability found here.

$$* \sigma_m = \sqrt{\frac{V_D + V_P + V_L - 2\sigma_e}{N}}$$

Conclusions

The major portion of the variability in WVP determinations in this cabinet can be assigned to the following sources: days, layers in the cabinet and positions in the cabinet.

The comparatively low value of the triple interaction, or error term, shows that other possible sources of error, such as weighing errors or moisture on the cups, are actually unimportant.

Since any variability in the film tested must also be included in the error term, these results show also that the sample of Pliofilm is not an important source of variability and for the purposes of these determinations can be considered uniform.

Practical Results

As a result of this work the sources of variability in WVP determinations are considered to have been definitely located and determinations are considered reliable within commercial limits.

To reduce the day variability, the cabinet has been moved to a room in which temperature is much more closely controlled (no formal test has yet been made to learn if the day variability has been reduced by the move). Because the uniformity of Pliofilm is considered to have been adequately demonstrated, two Pliofilm cups are always run in the cabinet as a check on the uniformity of conditions within the cabinet. Whenever possible, total variability is reduced by running samples for three or more days at a time. The procedure used is to run a conditioning period of 24 hours*, followed by a weighing, then 72 hours storage in the cabinet followed by a final weighing. However, when time is short, 24 hour results after the 24 hour, conditioning period are accepted tentatively.

Although there is as yet no completely adequate justification, high variabilities between samples on any given day are looked upon as indicating variability of the sample rather than variability in the WVP procedure, always providing that the Pliofilm values are within their usual range. This attitude is based upon the finding that the residual variance for all the within day errors and excluding only the day variance is 3.69, giving a standard deviation of 1.86. Ninety-five per cent of all pick-up values for each day for Pliofilm should lie then within 3.72 mg. of the daily mean for a material as uniform as Pliofilm. It is on this basis that deviations from the mean of greater than 4 to 5 mg. are taken as indicating variability in the sample greater than that of Pliofilm. This attitude is more or less justified by experience in that whenever variations of this magnitude or greater are found, they are generally reproducible for the same samples from day to day.

TABLE III.—ESTIMATED POPULATION VARIANCES

Days	4.627
Layers	0.6678
Positions	0.2992

* The necessity or lack of necessity for this conditioning period has not been quantitatively determined.

Literature Cited

1. Institute of Paper Chemistry. Instrumentation Studies LI, Penetration of Paper by Water Vapor, V. Methods for Measuring Vapor and Gas Permeability—a Bibliographical Study. *Paper Trade J.* 121, No. 13: 68, 74, 78, 80, 86, 91 (Sept. 27, 1945); No. 16: 33-42 (Oct. 18, 1945).
2. Packaging Institute. Standard Test Methods 2. For Water-Vapor Permeability at 100° F. *Modern Packaging* 19: 146, 147, 164-166 (August, 1946).
3. Rider, Paul R. An Introduction to Modern Statistical Methods, p. 15. New York, John Wiley & Sons, 1939.
4. Sear, Schlagenhauf, Given and Yett. Comparison of Methods for the Determination of Water Vapor Permeability. *Paper Trade J.* 118, No. 3: 39-40 (Jan. 20, 1944).
5. TAPPI Water Vapor Permeability of Paper and Paperboard. TAPPI Standard T464 m-44, July, 1944, 4 p. *Paper Trade J.* 119, No. 4: 29-32 (July 27, 1944).

Practical Emulsions

The Chemical Publishing Company has just issued the 2nd Edition, Completely Revised, of "Practical Emulsions" by H. Bennett, Technical Director of the Glyco Products Company (568 pp. 5½ x 8½). This new edition contains additional matter on partial fatty acid esters of polyhydric alcohols. Special sections have been added on the use of soap, lecithin, and pectin as emulsifying agents, and in surface-active germicides. A symposium on industrial emulsions has also been included. The most recently developed emulsion formulae have been added to the formula section.

Among the subjects covered are: Emulsifying Agents; Types of Emulsions and Foams; Methods, Formulation and Equipment; General Technical Emulsions; Synthetic Rubber Latex; Industrial Wax Emulsions; Emulsion Paints; Dye Emulsions, Dispersing Agents; Wetting Agents; List of Emulsions; Demulsifying and Defoaming Agents; Soluble Oils; Bituminous Emulsions; Cleaners and Soaps; Lacquer Emulsions; and Waterproofing Emulsions.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $5 per copy.

Water Soluble Gums

The Reinhold Publishing Corporaton has just issued "The Water Soluble Gums," by C. L. Mantell, consulting chemical engineer, New York, N. Y. (258 pp. 6 x 9, illustrated). The gums include a wide range of complex botanical products found primarily in the tropical regions of the world. Many are extracted from seaweeds and trees. These gums are colloid materials used as emulsifying and protective agents in hundreds of industrial products and processes. Their properties, chemistry, collection, preparation and application are described in detail. Special attention is devoted to their colloidal nature. Among the subjects covered are: Gums from the acacia tree; India gums —Ghatti, Karaya, etc.; Hydrophilic colloids from seaweeds; the hemicelluloses—locust bean gum, seed extracts, and Iceland moss; Modified celluloses; Modified starches; Water-dispersible proteins; Gum in paints, coatings, and textile applications; Specifications, identification, and testing; and Botanical, author, and subject indexes.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $6.00 per copy.

Dandy Roll Drive for Fine Paper Manufacture*

By Henry D. Johnston[1]

Abstract

A description is given of the development of the Spencer dandy roll drive.

In addition to providing a means of obtaining a clear watermark, it was possible to increase paper machine speeds from 10 to 30% with good formation. It was also noted that the wire width of the sheet was more nearly maintained at the reel.

Experiments indicated that the driven dandy had a speed as much as 8% faster than when the dandy was allowed to run "free" in the conventional manner and it is postulated that the better results are due to the absence of any "drag" which causes undesirable disturbance of the fibers.

About ten years ago the Strathmore Paper Company was approached by John Spencer, dandy manufacturer of South Hadley Falls, Mass., with a request for permission to make experiments leading toward the development of a method of driving dandy rolls on fourdrinier paper machines. Since the company had actively been cooperating with Mr. Spencer in trying to solve some watermarking problems, permission was readily granted and experiments were started. This objective was not new since an inspection of the patent office records will show that over a period of many years practical papermakers have been thinking and working towards a solution of the problem.

As most paper mill men will recognize, the most obvious way of tackling this problem was to devise a means of driving the dandy from the couch roll by means of belts. This was the starting point. It was, of course, necessary to insert some speed changing device between the couch roll and the dandy in order to provide a means of adjusting the relationship between the surface speeds of these two units and to provide for any desired range in dandy diameters. Such a device was provided and the initial experiments were under way.

Development of Drive

It soon became apparent that the use of flat belts would never produce the desired results and, therefore, a V-belt system was proposed. This system was carefully designed and installed, and the immediate results gave rise to the hope that a troublesome problem had really been solved. Upon attempting to duplicate the initial successes, it was found that the V-belt drive was not the answer if consistent and predictable results were to be secured.

With the failure of the V-belt method of driving dandy rolls, various methods of transmitting power in some manner which would allow absolutely no slippage between the driver and the driven unit were considered. After a study of several possible mechanical connections, it was decided that roller chain drives would probably provide the most practicable way to solve the problem. It was thoroughly recognized, of course, that there would be lubricating problems involved in the use of this type of drive on the wet end of a paper machine.

Keeping in mind the minimum possible interference with the operation of other mechanical elements of the machine, a chain drive between the couch roll and the dandy roll was designed and installed. In order to give accurate and dependable adjustment of dandy speeds and to allow for various dandy sizes, a P.I.V. unit provided one step in this transmission.

It seemed desirable to place in this positive mechanical connection some protective device which would permit the dandy roll to run freely or "freewheel" in the event that the P.I.V. were adjusted to give a lower speed than that of the wire or should there be any mechanical failure in the transmission. To meet this condition an over-running or freewheeling clutch was especially designed by a prominent clutch manufacturer. This protection means that at no time can the drive "drag" the dandy.

It soon became apparent that the basic problem of satisfactorily driving a dandy roll had been solved. From a mechanical standpoint attention was turned toward the elimination of the collection of shafting, chains, and sprockets which might be expected to provide somewhat of a maintenance problem as time went on. The problem was answered by the development of the electric drive. This step in the refinement of the Spencer drive was accomplished with the cooperation of the General Electric Company who designed the necessary electrical units. This gave a positive connection between the couch roll and the dandy roll which provided a definite relationship between the speeds of these two units. Again, the speed changing mechanism selected was the Link Belt P.I.V. drive.

The installation of the electric drive gave a drive which responded instantly to changes in paper machine speeds and which could be adjusted with a high degree of accuracy to give the machine tender a workable range of dandy roll speeds to meet the conditions of any particular sheet he might be making.

Figure 1 shows how this drive appears on the front side of the machine.

The fact that the Spencer drive was the first drive to achieve these results was recognized by the Patent Offices both in the United States and Canada when they issued patents covering the driving of a dandy in such a manner "that the peripheral speed of the dandy bears a definite predetermined speed relative to the lineal speed of the wire, the said peripheral speed of the dandy being relatively faster by a few per cent than the lineal speed of the wire and variable accordingly as that of the wire varies."

Operating Results

The results obtained from the operation of this drive went far beyond the goals originally sought. For instance, the company manufactures a sheet which contains an all-over watermark. This sheet is

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Strathmore Paper Co., West Springfield, Mass.

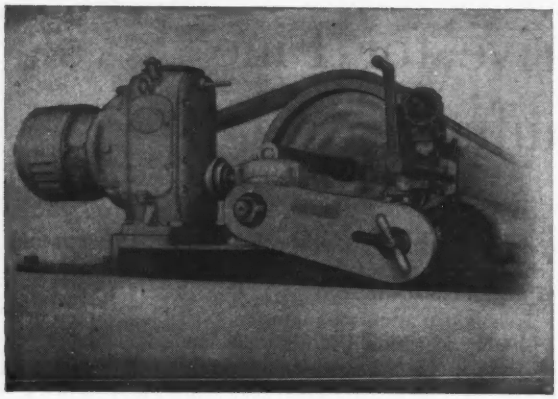

FIG. 1
Dandy Roll Drive Installation

particularly difficult to make to the desired physical characteristics and at the same time to obtain a satisfactory watermark. Previous experiments with changes in the dandy roll itself to secure an improved mark had been of no benefit. As a result of the installation of the drive, however, it was possible to continue making this particular sheet with the desired physical characteristics, and, at the same time, produce a beautifully clear watermark that was far ahead of anything imagined possible under the conditions.

Of far greater importance in the overall picture than the mere improvement in appearance of this particular sheet, however, a benefit appeared which had not been anticipated. It was discovered that, whereas prior to the installation of the dandy roll drive a poor watermark was obtained, after the installation of the drive it was possible to obtain a very satisfactory mark and at the same time increase the machine speed substantially. While a small gain in speed was expected as a result of removing the drag of the dandy roll, the magnitude of the gain was far beyond expectations. In this particular case, the increase in machine speed was 30%. Any paper mill man will certainly recognize what this means in dollars and cents of machine hour profit.

The possibility of the dandy roll drive as a means of securing not only an improvement in quality but also a definite saving in manufacturing cost was realized. Therefore, clutches were installed on all of the dandy rolls and the possibilities existing in all grades of paper explored. As a result of the experiments covering all grades of papers, it was found that, in addition to greatly improved watermarks, the increases in paper machine speeds ran from 10 to 30%.

Figure 2 shows the improvement in several grades of paper as a result of driving the dandy roll.

A second and equally important unanticipated result came to light with the widened scope of experiences. It was found that not only was improved appearance plainly visible in watermarked sheets, but that even in plain wove sheets the improvement in closing was immediately evident. This fact is of perhaps wider interest than the watermarking picture, inasmuch as plain wove papers form the greater bulk of production in many mills. Here it was found that with sheets which were cloudy or a little wild, the formation could be cleared up to a very noticeable degree. At the same time, increases in speed were attained in the same order of magnitude as those previously discussed.

It may be that future users of dandy roll drives might benefit from one principle which was established after learning it the hard way. That is if a sheet of paper is being made at a speed which gives an entirely satisfactory appearance, the application of power to drive the dandy roll will not bring about an improvement which is nearly as startling as if the paper machine were operating at a higher speed than that which would normally give a good appearance to the sheet.

To illustrate this point with a specific example, a grade of paper was being made which gave an entirely satisfactory appearance at 250 feet per minute. It was found that the difference in the appearance of the sheet with or without the dandy being driven was not too great. When, however, this machine speed was increased to from 300 to 350 feet per minute, it was found that it was not possible to make a satisfactory closed sheet with the dandy roll drive running free in the conventional manner, but is was entirely possible to make a satisfactory sheet as long as the dandy was driven.

A further result which became apparent in the course of experience with this drive was that driving the dandy roll at the proper speed actually causes the sheet to widen to the extent of about three quarters of 1%. This may seem like rather an insignificant figure, but in this case it was particularly important on one of the grades for which it was necessary to get the maximum fill of the machines. Any unusual shrinkage caused a lot of trouble until corrected and the dandy drive, therefore, gave an added margin of safety.

It is not implied that these results came about simply by installing a dandy roll drive and pushing a button. Into the development of this drive went a great amount of patient and painstaking effort on the part of Harold A. Boles, the mill superintendent, who took every discouraging failure in his stride and worked diligently with Mr. Spencer to find the answer. The day finally came, however, when the major problems were answered and the machine tender could, in all reality, "push the button" and get the same results as he had the day before.

Action of Dandy

Having reached the point where he knew what to expect every time, there was a natural interest in

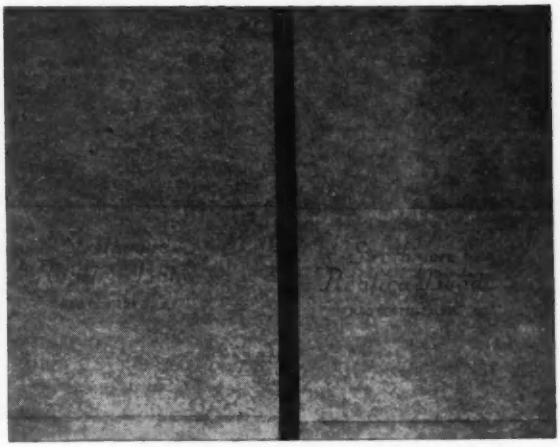

FIG. 2
Without Driven Dandy — With Driven Dandy

"why" these remarkable results came about through such a seemingly simple operation.

As a starting point in the attempt to determine the reasons, it was decided to determine just what increase in dandy roll speed was actually taking place. It was found that this increase varied with the weight of the paper, the speed of the machine, the wetness of the stuff as it went under the dandy roll, and the type of dandy—that is, whether plain wove, plain laid, or watermarked. This difference in speed ran as high as 8% in some cases. The data assembled from a large number of tests showed that the dandy was being driven at a speed as much as 8% faster than when the same dandy was allowed to run "free" in the conventional manner.

Since the magnitude of this differential was a considerable surprise, it was decided to check the actual peripheral speed of the dandy roll against the actual surface speed of the wire. These measurements gave only about one half of the differential previously measured between a driven and an undriven dandy roll. It appeared, therefore, when the dandy was not driven there was a measurable slippage which sometimes ran as high as 4% between the dandy roll and the wire.

When the speed of the driven dandy roll was adjusted to give optimum operating conditions, it was determined that not only had the normal slippage of a free running dandy roll been overcome, but the driven dandy had been given a "lead" of from 1 to 4% so that the surface speed of the dandy was actually 1 to 4% greater than the speed of the wire. The actual operating speed under any given set of conditions is strictly empirical and can only be determined by the machine tender by actual observation of the stuff as it comes out from under the roll. Should he increase the dandy roll speed beyond the optimum point, this fact will be immediately apparent because the dandy will start to "lick".

Experience has shown that approximately 1 hp. is required to drive a 100-inch dandy at 300 feet per minute. This figure is only a general guide to the magnitude of power requirements and cannot be taken as a basis for any exact calculations.

With a knowledge of what was actually being done to the dandy roll, an attempt was made to develop a theory which would explain the reason for the improved closing and watermarking. Frankly, any attempts to justify these results mathematically were abandoned. It is believed that, basically, the improvement comes from having relieved the sheet of the necessity of driving the dandy roll from the wire through a wet web of paper and by making it possible to revolve the dandy at whatever speed produces the desired watermarking or closing without resulting in an undesirable disturbance of the fibers due to the "drag" of the dandy previously described.

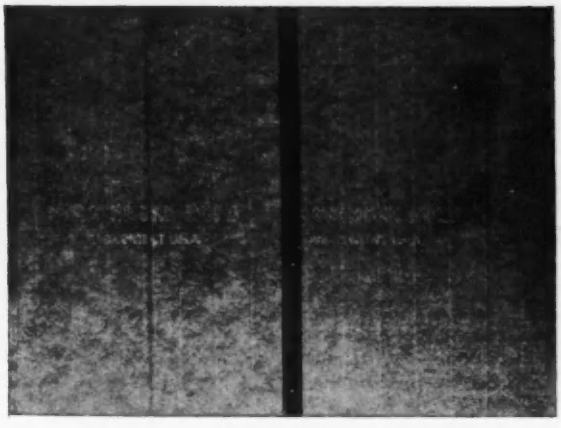

FIG. 3

Without Driven Dandy — With Driven Dandy

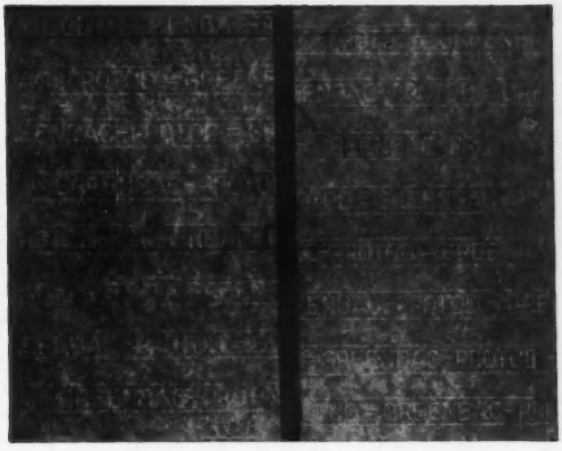

FIG. 4

Without Driven Dandy — With Driven Dandy

Figure 5 shows the results of observations as to the effect of driving the dandy roll on the wet web of stock. Examination of these sketches will show that the puddle or roll of stock back of the dandy tends to disappear when the dandy is driven at the proper speed and probably accounts for the general experience that the driven dandy runs cleaner and has less tendency to clog.

It may seem to some that a substantial portion of these gains in paper machine speed could well be attributed to normal improvements in beating techniques, paper machine changes, changes in furnish, and similar improvements that enter into the day-by-day operation of a paper mill. It has been possible to prove conclusively that this is not so. Running as is done at the present time with the dandy roll drive in constant operation, it is found that if the clutch which drives the dandy is disengaged, an immediate deterioration in the appearance of the sheet takes place. In order to bring this appearance back to the present standard as attained with the driven dandy, it is necessary to reduce the machine speeds by approximately the amount of gains previously cited.

The results obtained in a number of other paper mills where the Spencer drive is installed are very definitely favorable in all cases on a great variety of grades and weights of paper.

Probably many fine paper mills have the problem of "localizing" water-marks so that they will appear a reasonably exact distance apart in the finished sheet of paper. Experience had been that even after exercising the greatest of care in purchasing a dandy roll of the proper diameter, reliance had to be placed on the undesirable practice of adjusting the "draws" between sections to get the required results. With the dandy roll drive, however, it was possible to secure these results simply by varying the speed of the dandy a very small amount.

Another fact believed to be true but which cannot be substantiated with figures is that an increase in dandy life is gained when the burden of driving the

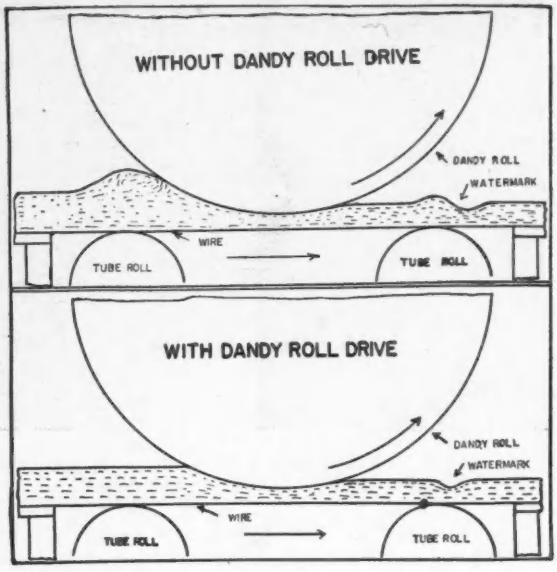

FIG. 5
Effect of Driving Dandy Roll on Wet Web of Stock

dandy roll itself is removed from the cover of the dandy. There is, in the case of installations on higher speed machines, considerable evidence to support this fact.

It is very difficult to estimate the dollar value of the improvement in the quality of the paper which may be attributed to dandy roll drives. It is known, however, that the increase in machine speeds alone has yielded sufficient financial returns that no time was lost in equipping every fourdrinier machine in the company plants with the Spencer dandy roll drive.

Electrical Engineering Problems

The Chemical Publishing Company has recently issued "Electrical Engineering Problems and Their Solution" by T. F. Wall, Lecturer-in-Charge, Department of Electrical Engineering, University of Sheffield (England), (312 pp. 5½ x 8½). This is entirely a book of stated problems and their solution, as the title indicates. The examples are chosen and arranged to emphasize the different aspects of the principles dealt with in the various chapters of the book, and to clarify points that might otherwise be obscure.

Among the broad subjects covered are: Fundamental Units; Coulomb's Law; Capacitance; Current Distributers and Networks; Thermo-electricity; Magnetism; Alternating Currents, Oscillating System; Graphical Methods; Electromagnetic Waves Through Space and the Propagation of Electrical Energy Along Transmission Lines and Cables.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $5 per copy.

TAPPI Notes

E. A. Warner is now plant manager for the Armstrong Cork Company, Macon, Ga.

John Willy, formerly of the American Reenforced Paper Company, is now chemical engineer for Protection Papers, Inc., Union, Ill.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

F. Parker Bartlett, Jr., Technical Director, Union Paste Co., Hyde Park, Massachusetts. He attended Harvard University.

Ross A. Easter, Head, Packaging Section, Research Dept. Pillsbury Mills, Inc., Minneapolis, Minnesota, a 1940 graduate of the University of Minnesota.

George C. Ehemann, Jr., Plant Engineer, The Ohio Boxboard Co., Rittman, Ohio, a 1932 graduate of Carnegie Institute of Technology.

George W. Flanagan, Manager, Sales Service Laboratory, B. F. Goodrich Chemical Co., Cleveland, Ohio, a 1932 graduate of the University of Minnesota.

Raymond K. Guinard, Chief Chemist, New York & Pennsylvania Co., Inc., Johnsonburg, Pennsylvania, a 1937 graduate of Pennsylvania State College.

Theodore C. Heyward, Manager, Combustion Engineering Co., Inc., Charlotte, North Carolina, a 1908 graduate of Clemson College.

Irving D. Hughes, Jr., Chemist, Crane & Co., Inc., Dalton, Massachusetts. He attended Pennsylvania State College.

Eugene H. Kennedy, Chemical Engineer, Paper Mill Equipment Div., Combustion Engineering Co., Inc., New York City, a 1920 graduate of the University of Delaware with an M. S. degree from Massachusetts Institute of Technology in 1921.

Erland F. C. Kiosterud, Jr., Student, A/S Krogstad Cellulosefabrik, Mjondalen, Norway, a 1942 graduate of the College of Drammen City.

William T. Kirby, Chemist, Crane & Co., Inc., Dalton, Massachusetts. He attended Clark University.

Thomas E. O'Grady, Assistant Superintendent, American Coating Mills, Inc., Elkhart, Indiana.

William D. Parrish, Manager, Technical Service, B. F. Goodrich Chemical Co., Cleveland, Ohio, a 1929 graduate of the University of Illinois.

Thomas E. Ramsey, Chemical Engineer, Ecusta Paper Corp., Pisgah Forest, North Carolina, a 1938 graduate of Clemson College, with an M. S. degree from North Carolina State College.

Carl Edward Schmitz, Chief Engineer, Crane Packing Co., Chicago, Illinois. He attended the University of Illinois.

A. Sensor Ryan, Fellow, Vermont Bureau of Industrial Research, Norwich University, Northfield, Vermont, a 1944 graduate of Rutgers University.

Frederick N. Sprague, Assistant Chief Chemist, St. Regis Paper Co., Bucksport, Main, a 1936 graduate of the University of Maine.

Walter D. Esselstein, Plant Superintendent, Bemiss-Jason Co., San Francisco, California. Attended the University of California.

John R. Gunning, Chemical Engineer, Provincial Paper Ltd., Toronto, Ont., Canada, a 1940 graduate of Queen's University.

Geoffrey V. Lund In Charge of Research, Development and Testing, James Kenyon & Son Ltd., Crimble Mill, Heywood, Lancashire, England, a 1940 graduate of Leeds University.

James P. Smith Jr., Plant Engineer, Holyoke Card & Paper Co., Springfield, Massachusetts. Attended Wesleyan University.